User's Manual

High Speed Digital Camera System

MEMRECAM GX-5

Model ST-769

June 2009

nac Image Technology, Inc.

Introduction

The MEMRECAM GX-5 is designed to analyze images moving at speeds not visible to the naked eye.

The MEMRECAM GX-5 has an unitized configuration with an IC memory as the storage medium and the camera head structure that it divided and so is a high speed digital camera that possesses the identical compact nature of a high speed film camera, the same immediate playback function of a high speed video camera, and can handle the digital data from all of the images after recording.

The MEMRECAM GX-5 easily performs the high speed photography necessary for high speed techniques. Photography and analysis without the use of a computer is possible with the included software containing the functions of remote operation from a computer with the simple operation of the included remote controller, image storage to a USB compatible external storage medium using the USB port and live image display using the viewfinder or monitor.

The MEMRECAM GX-5 is designed for high speed and superior image quality requirements. Photography at a resolution of 640 x 480 pixels is possible with a photographic speed of 1,000 frames per second. High speed photography is possible up to 100,000 frames per second (32(H) x 16(V)) using a split frame. Also, high speed image transmission to the control computer can be performed according to the high speed network (10BASE-T, 100BASE-TX, 1000BASE-T).

The MEMRECAM GX-5 performs high speed photography in demanding test environments, and is compact, durable, vibration and shock resistant, as well as possessing properties resistant to magnetism.

This user's manual provides the specifications, operating methods, interface with peripheral equipment and system expandability information to use the MEMRECAM GX-5 with these features.

Trademark

MEMRECAM is a registered trademark of nac Image Technologies, Inc.

Read Before Using

Safety Precautions

To ensure safe use of this device, please completely read all of these following precautions before use. When using this device, the following symbols and warnings are displayed for areas where particular caution is necessary for safety. If there is a safety alert symbol within the description, please read the warning carefully before beginning operation. There may be unexpected problems due to conditions and circumstances of use of the device that are not listed below. Please carefully read all of the user's manual for the device. Directly contact the retail outlet if there are questions about this device.

DANGER

This indicates the existence of an imminently dangerous situation that could result in death or serious bodily injury to the user if the precaution is not observed.

WARNING

This indicates the existence of a potentially dangerous situation that could result in death or serious bodily injury to the user if the precaution is not observed.

CAUTION

This indicates the existence of a potentially dangerous situation that could result in slight bodily injury or moderate damage to the user if the precaution is not observed. This warning sign indicates a warning relating to faulty operation and the existence of areas where there is concern of damage to this device or connected devices.

Handling Precautions

Safety alert symbol

This is a「Safety Alert Symbol」.

This symbol is intended to alert the user of items or operations that could be dangerous to oneself or others during the use of this device. Carefully read the messages accompanying this symbol and follow the instructions to safely use this device.

Grounding terminal symbol

This symbol is displayed in areas with grounding terminals. If not grounded, electrical shock may occur when metal or other parts of the device are contacted. Do not ground, due to the dangers involved.

If a 3P-2P conversion plug is used to connect to the power outlet, connect the grounding wire of the conversion plug to the grounding terminal.

High voltage warning symbol

This symbol is displayed in areas of dangerously high voltage.

Remove the power cable from the outlet when replacing fuses.

Do not remove the cover of this device. Electrical shock could occur if this device is handled with the cover removed even if the power switch is OFF.

Precautions for Use

⚠ Caution Verify Power Input

Power input to the system should be AC 100~240V/47~63Hz when using the AC adapter enclosed, and DC20~32V when using DC power or batteries. Please verify power voltage, frequency and polarity prior to connecting to power.

⚠ Caution Operating Environment

- Use in locations where the ambient temperature is 0~+40°C and the RH is 30~80%. Use where there is no condensation.
- Store where the ambient temperature is -10~+60°C and the RH is 20~80%. Store where there is no condensation.
- Avoid using in locations with smoke, corrosive gases or strong magnetism.
- Do not store in locations subject to direct sunlight, rain or salt water.
- Do not use in locations with excessive dirt, dust, sand or moisture.

⚠ Caution Vibration and Shock

The MEMRECAM GX-5 is a model designed and manufactured to withstand strong vibration and shock, and may be installed in vehicles. However, please take the following precautions.

- The vibration and shock resistant properties are only present in the DRP unit and the camera head unit. There are no vibration and shock resistant properties present in the AC adapter or JPAD3. Please visit your retail outlet to purchase power sources and lenses with vibration and shock resistant properties.

- If connecting a cable to the connector of the main camera unit, all of the connectors will have shock and vibration resistant properties.

- There are ten M10 screw openings on the back of the camera for use when installing attachments with vibration and shock resistant properties to the main camera unit.

⚠ Caution Handling the DRP Unit

The inside of the DRP unit contains parts that are precisely manufactured and installed. Please keep the screws in the DRP cover tightened and do not open the cover under any circumstances (even if the DRP unit does not operate properly). It may not be possible to recover the functions of the camera.

⚠ Caution Generation of Heat

Heat will be generated during operation of the system but it will not interfere with operation. If an abnormal amount of heat is generated, turn off the power and unplug from the outlet. Directly contact the retail outlet or this company.

⚠ Caution Handling the Lens Mount

Remove the lens or cap on the lens mount of the camera to view the camera contents. Do not touch or place items inside. This could damage the optical system, and any dust could adversely affect the image.

⚠ Caution Handling Cables

Turn the power off while connecting or removing cables.
With the power still on, connecting or removing cables could result in a malfunction, or electrical shock.
Do not put metal parts into the connectors.

⚠ Caution Handling the Battery

The MEMRECAM GX-5 is equipped with a standard memory backup battery so do not place in direct sunlight in vehicles, near fire, on the stove or any location with high temperatures. The battery could leak and adversely affect performance of the battery of its life.

Do not use the memory backup batteries for any other purpose. The battery could leak, generate heat or malfunction.
Contact a retail outlet for replacement memory backup batteries.

⚠ Caution Handling When Moving or Transporting

Use the special carrying case for this product when moving or transporting.

⚠ Caution Amplification of Sensor Noise

The temperature of the image sensor used in this product alters the screen noise. This noise has a pattern that differs from the stationery pattern noise for each sensor. In this product, noise reduction is performed by correcting the temperature changes as well as the stationery pattern noise for the sensor.
If a finer image quality is desired, adjust the black balance immediately prior to photographing. (Cf. 3-48 3.3.8 black balance)

Depending on the conditions and circumstances of use of the device, there may be malfunctions other than those listed above. Please carefully read all of the user's manual for the device. Directly contact the retail outlet if there are questions about this device.

Parts to be Replaced on a Regular Basis

・Clock Battery

The clock battery will last for approximately 8 years. Replacement cannot be made by the user so please contact the retail outlet or this company.

・Memory Backup Battery

Please replace the memory backup battery approximately one year after purchase. If the discharge rate accelerates or if there are differences in amount of use, please replace immediately. Replacement cannot be made by the user so please contact the retail outlet or this company.

Warranty

The warranty period for the MEMRECAM GX-5 is for one year after delivery.
For details, refer to the attached warranty.

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1
Overview

1.1 MEMRECAM GX-5 Components

The MEMRECAM-GX-５ high speed digital camera system is comprised of the following components.

Table1-1a Standard Components

Name of Part	Model	Quantity
MEMRECAM GX-5 DRP (Digital Recording Processor)	V-338	1
Simple J1 Cable (TRIG 1 only)	584592	1
Simple J2 Cable (Viewfinder, J-Pad 3, USB only)	584258	1
Simple J3 Cable (Ethernet only)	584260	1
Video BNC Conversion Cable (0.2m)	584254-2	1

Table1-1b Optional Components

Name of Part	Model	
Full Wired J1 Cable (GX1 Power, TRIG 1, EST, ARM & FAULT)	584353	
Full Wired J2 Cable (Viewfinder, J-Pad 3, USB & ARM Command in)	584355	
Full Wired J3 Cable (Ethernet, EST, IRIG, TRIG 2 (Photo-isolation & EPO)	584357	
Viewfinder Monitor	584367	
AC Adapter for GX-5 (with or without American type AC plug)	584541-1	584541-2
MEMRECAM GX5 Micro Camera Head w/ 5m Cable (see photo below)	584543	
MEMRECAM GX5 Micro Camera Head w/ 60cm Cable (see photo below)	584759	
MEMRECAM GX5 4m Camera Extension Cable	584621	
Mounting Bracket for Micro Head, SS	4H2207-1	
Mounting Bracket for Micro Head, SA & AS	4H2207-2	
Mounting Bracket for Micro Head, AA, AR	4H2207-3	
Hi-G Battery, 24VDC, 7.5Ah for GX-5	3H1058	
MEMRECAM GX J-Pad 3 Remote Control Unit	584028	

MEMRECAM GX-5 Micro Camera Heads

SS – Straight Head, Straight Connector

SA – Straight Head, Angled Connector

AS – Angled Head, Straight Connector

AA – Angled Head, Angled Connector

AR – Angled Head, Return-angled Connector

1.2 Exterior

The exterior of the MEMRECAM GX-5 DRP is shown below (Figure 1-1).

Figure 1-1 MEMRECAM GX-5 DRP exterior

1.2.1 Front Panel

The front panel of the MEMRECAM GX-5 DRP is shown below (Figure 1-2).

The current status for each port and the camera head connected to it is displayed on the front panel by eight PORT LED. In addition the status for the DRP is displayed by the STATUS LED. A maximum of eight cameras can be connected to the GX-5.

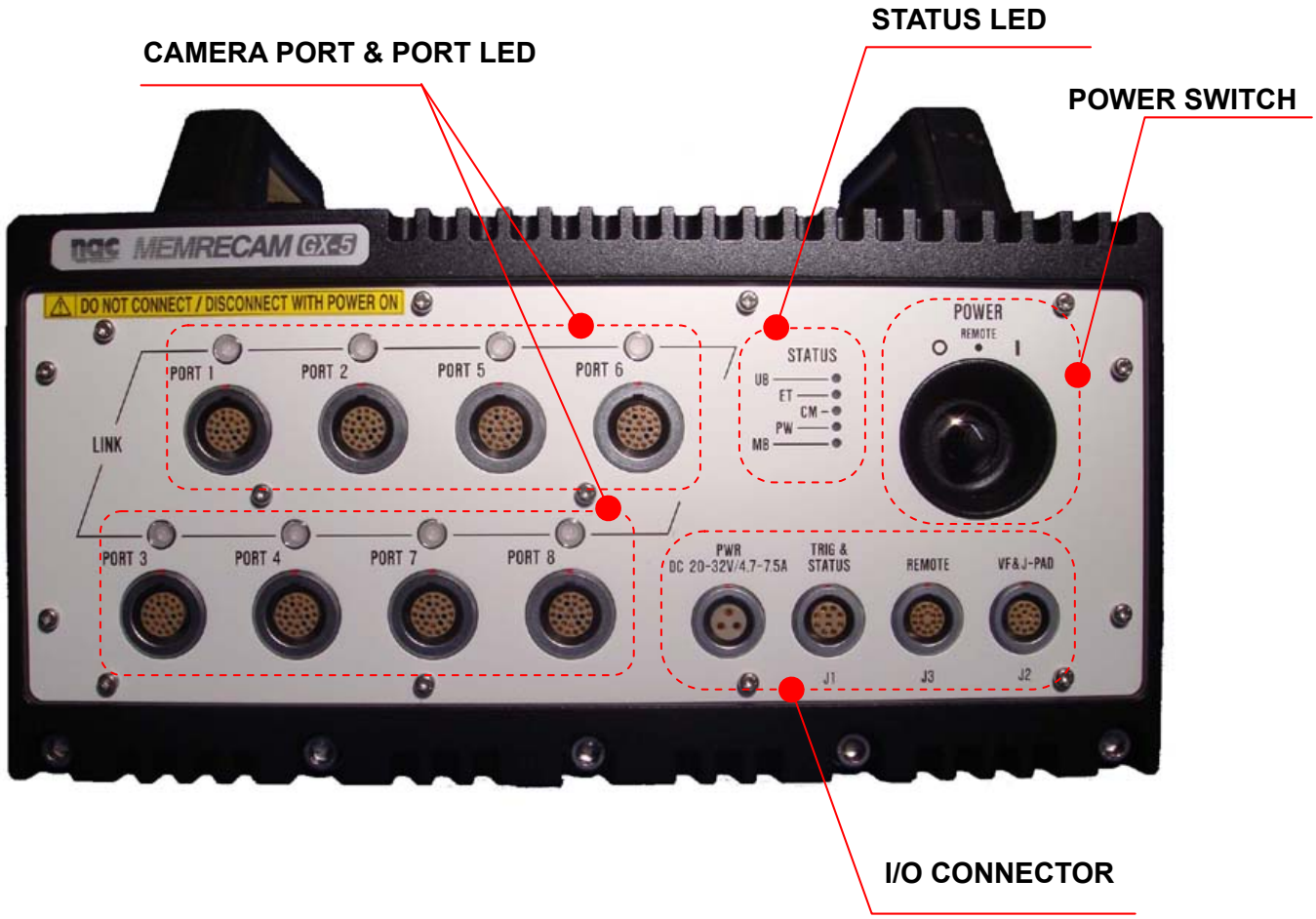


Figure1-2 MEMRECAM GX-5（Front Panel）

1） Input/Output Connector

There are four input/output connectors on the front panel. The input/output signals and cable connections for each connector are shown below (Table 1-2).

Table1-2 Input/Output Signals and Cable Connections

Name of Connector	Name of Branch Connector	Input/Output Signal
J1 (TRIG&STATUS) **ID color: Yellow**	TRIG1	Falling trigger input – Contact Closure / TTL External（TRIG1）
	EST1 (※1)	*Start Exposure* signal input（**EST1**）
	ARM-O (※1)	*ARM Status* output
	FAULT (※1)	*FAULT Status* output
J2 (VF&J-PAD) **ID color: Green**	VF	*Video* signal output
		DC24V output (VF power)
	JPAD	*RS232C*（Remote Control JPAD3 connection）
		DC24V output (JPAD3 power)
	USB	*USB* (USB compatible storage media connection)
	ARM-I (※2)	*ARM Command* input **(ARM-I)**
J3 (REMOTE) **ID color: Blue**	ETHER	Ethernet (control PC connection)
	TRIG2 (※3)	External trigger input (TRIG2)
	EST2 (※3)	*Start Exposure* signal input / event input (**EST2**)
	IRIG-B (※3)	IRIG-B time code input (**IRIG-B**)
	EPO (※3)	Exposure panel output (EPO)
	PWRCNT (※3)	Remote Power Control signal input (**PWRCNT**)
PWR		**Power Input (DC 24V)**

(※1) **Full Wired J1** cable (optional) required.
(※2) **Full Wired J2** cable (optional) required.
(※3) **Full Wired J3** cable (optional) required.

1. EST1 Input

When the MEMRECAM GX-5 is set to **EST1** mode, the Exposure Start Signal is synchronized to the input signal received on the **Full Wired J1** cable, branch **P11 (EST1)** from an external pulse generator. Please refer to ***/ 7 / Specifications / APPENDIX B - Exposure Start Signal (EST) and Event Signal /*** for additional details.

2. EST2 Input

When the MEMRECAM GX-5 is set to **EST2** mode, the Exposure Start Signal is synchronized to the input signal received on the **Full Wired J3** cable, branch **P32 (EST2)** from an external pulse generator. Please refer to ***/ 7 / Specifications / APPENDIX B - Exposure Start Signal (EST) and Event Signal /*** for additional details.

3. ARM Command Input

The MEMRECAM GX-5 will enter **ARM** mode when a signal is supplied to the **Full Wired J2** cable, branch **P20 (ARM-I)**. Please refer to ***/ 7 / Specifications / APPENDIX D - Discrete Interface/*** for additional details.

4. IRIG-B Input

When the MEMRECAM GX-5 is set to **IRIG-B Synchronous** mode, the camera is synchronized to the input signal received on the **Full Wired J3** cable, branch **P33 (IRIG-B)** from an IRIG time clock generator. Please refer to ***/ 7 / Specifications / APPENDIX E IRIG-B /*** for additional details.

5. Power Control Signal Input

When the power switch on the MEMRECAM GX-5 front panel is set to **REMOTE** the camera can be turned ON and OFF remotely via the **Full Wired J3** branch cable, branch **P36 (PWRCNT)**. With the circuit open (HI) the power is ON. When there is a short or LOW signal the power is turned OFF. Please refer to ***/ 7 / Specifications / APPENDIX D - Discrete Interface/*** for additional details.

2） Status LED

There are five status LEDs on the front panel showing the status of the MEMRECAM GX-5. The color displayed for each LED and the flashing status changes according to the change in status. (Table 1-3).

Table 1-3 LED Status Display

LED Name	Color and Flashing Status	MEMRECAM GX-5 Status
UB (USB)	Lit green	Connected to USB compatible storage media
	Not lit	Not connected to USB compatible storage media, or Power OFF
ET (ETHERNET)	Lit green	Connected to network
	Flashing green	Communicating with network
	Not lit	Not connected to network or Power OFF
CM (CAMERA MODE)	Lit blue	STOP mode
	Lit white	VIEW mode
	flashing white	VIEW mode (during EST synchronized signal recording)
	Lit magenta	ARM mode
	flashing magenta	ARM mode (during EST synchronized signal recording)
	Lit orange	REC mode
	flashing orange	REC mode (during EST synchronized signal recording)
	Not lit	Power OFF
PW (POWER)	Lit green	Power ON (normal status)
	Lit red	Power ON (fail status (※1))
	Not lit	Power OFF
MB (MEMORY BACKUP) (※2)	Lit green	Valid memory backup, Charge: High (backing up with external power)
	Flashing green	Valid memory backup, Charge: High (backing up with battery)
	Lit orange	Valid memory backup, Charge: Medium (backing up with external power)
	Flashing orange	Valid memory backup, Charge: Medium (backing up with battery)
	Lit red	Valid memory backup, Charge: Low (backing up with external power)
	Flashing red	Valid memory backup, Charge: Low (backing up with battery)
	Not lit	No memory backup data

(※1) Fail status: During MEMRECAM GX-5 operation it indicates that a malfunction detected (i.e. abnormal power voltage, increase in the sensor temperature, abnormal trigger signal, etc.)

(※2) The charge amount is impacted by differences in batteries and the ambient temperature, and is not precisely displayed. Use only as a guide.

３） Power Switch

Operation of the power switch is shown below.　It is assumed that the power supply is energized and connected to the MEMRECAM GX-5.

1. When the power switch on the front panel is set to「○」the MEMRECAM GX-5 is turned **OFF**.

2. When the power switch on the front panel is set to「｜」the MEMRECAM GX-5 is turned **ON**.

3. The「**REMOTE**」setting on the power switch is used when operating with the GX-HUB (optional) or when controlling remotely via the **Full Wired J3** branch cable, branch **P36 (PWRCNT)**.

With the GX-Hub connected the power switch on the GX-HUB controls the power setting of the MEMRECAM GX-5 DRP.

With an open circuit (HI) on the J3 **(PWRCNT)** connector the power is ON.　When there is a short or LOW signal the power is turned OFF.　When not connected to a GX-HUB and the MEMRECAM GX-5 power switch is set to「**REMOTE**」the DRP turns ON.

4） Camera Port , Port LED

Warning **Always turn the power OFF when connecting and disconnecting camera heads. It is possible to damage the electronics and/or electric shock.**

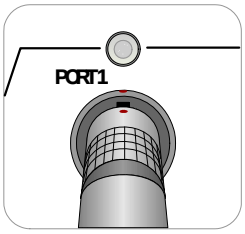
The camera heads connect to PORT1-PORT8 respectively and an LED shows the connection status for each port. Each LED lights up and changes color according to changes in status (Table 1-4).

Table 1-4 Description of the port LED

	Display Color and Flashing Status	Readiness to take a picture	Connected status of camera head	Status of port
①	Not lit	–	Before Startup	-
②	Flashing green(quick)	–	During Startup	-
③	Flashing yellow(slow)	△	Startup Successful	Disabled
④	Flashing yellow(quick)	×	Not Connected	Enabled
⑤	Lit yellow	×	Not Connected	Disabled
⑥	Lit green	○	Startup Successful	Enabled
⑦	Flashing red(quick)	×	Startup Failure	Enabled
⑧	Lit red	×	Startup Failure	Disabled

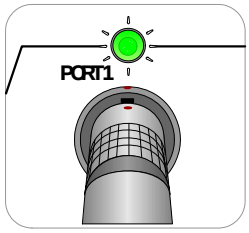
NOTE: If the correct camera configuration is set, it is possible to operate a camera connected to a port with the LED Flashing yellow (slowly) "△". **Do not** connect the camera with the power turned on.

LED - OFF
When the MEMRECAM GX-5 is first turned on, all the port LED remain off while the DRP starts up.



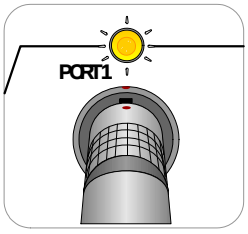
LED : Turn off

LED – Flashing YELLOW (Quick)
After the DRP completes its initial boot sequence, all the port LED flashes green (quick) when the DRP attempts to start up the camera heads.



LED : Flashing green(quickly)

LED – Flashing YELLOW (Slow)
The port LED flashes yellow (slowly) when a camera head is connected to a disabled (invalid) port. *It is necessary to perform one of the following.*



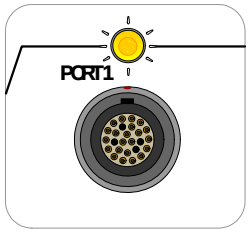
LED : Flashing yellow(slowly)

- Change the camera configuration to enable the port. Please refer to ***/ 2 / Basic Operation / 2.4 / Camera Configuration Setup /*** for additional details.
- Turn off the power and move the camera head to an enabled (valid) port.
- Turn off the power and disconnect the camera head from the disabled (invalid) port.

LED – Flashing YELLOW (Quick)
The port LED flashes yellow (quick) when a camera head is not connected to the enabled (valid) port. *It is necessary to perform one of the following.*

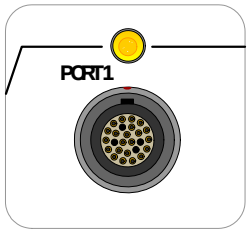
- Change the camera configuration to disable the port. Please refer to ***/ 2 / Basic Operation / 2.4 / Camera Configuration Setup /*** for additional details.

- Turn off the power and connect a camera head to the enabled (valid) port.



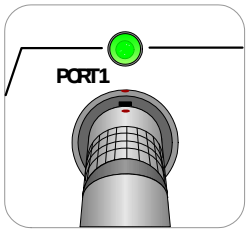
LED : Flashing yellow(quickly)

LED – Lit YELLOW (Solid)
When the port is disabled (invalid) and there is no camera head connected to it, the LED remains solid yellow.



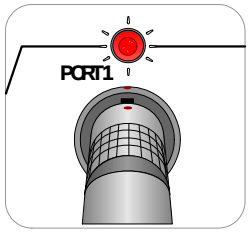
LED : Light yellow

LED – Lit GREEN (Solid)
When the port is enabled (valid) and there is a camera head connected to it, the LED remains solid green. The port has successfully connected to the camera head and is ready to record.



LED : light green

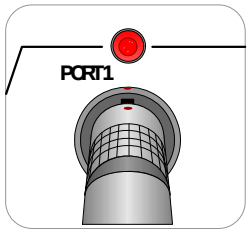
LED – Flashing RED (Quick)
When the port is enabled (valid) but there is a problem communicating with the camera head connected to it, the LED flashes red (quick).



LED : Flashing red(quickly)

LED – Solid
When the port is disabled (invalid) and there is a problem communicating with the camera head connected to it, the LED remains solid red.

Moreover, when the camera configuration setting is done in the state of □, LED of the port lights red.



LED : Light red

1.2.2 Side Panel

The MEMRECAM GX-5 side panel (left) is shown below (Figure 1-3).

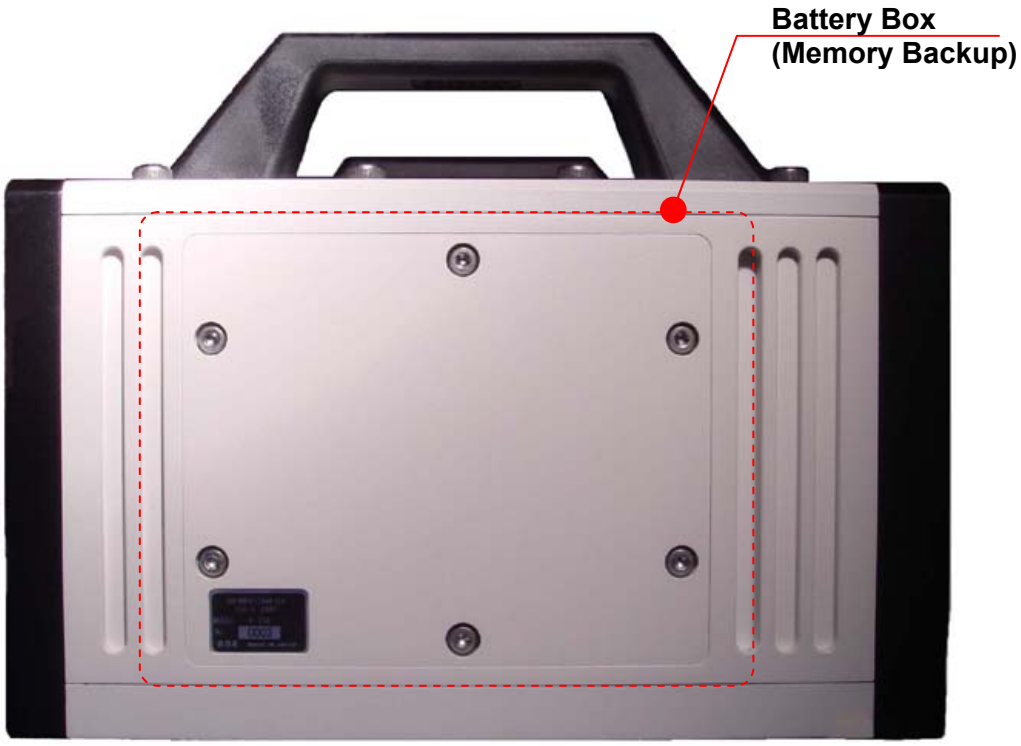


Figure 1-3 MEMRECAM GX-5 DRP（Side Panel）

Battery Box (Memory Backup)

The memory backup battery is stored in the battery box on the left side panel. Please refer to ***/ 7 / Specifications / 7.4.6 – Memory Backup/*** for additional details.

1.2.3 Camera Head Configurations

MEMRECAM GX-5 Micro Camera Heads

SS – Straight Head, Straight Connector

SA – Straight Head, Angled Connector

AS – Angled Head, Straight Connector

AA – Angled Head, Angled Connector

AR – Angled Head, Return-angled Connector

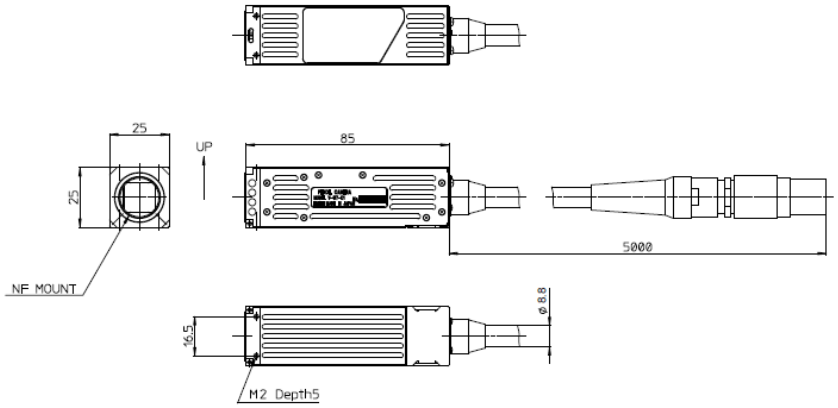


Figure 1-4 Camera Head Type SS

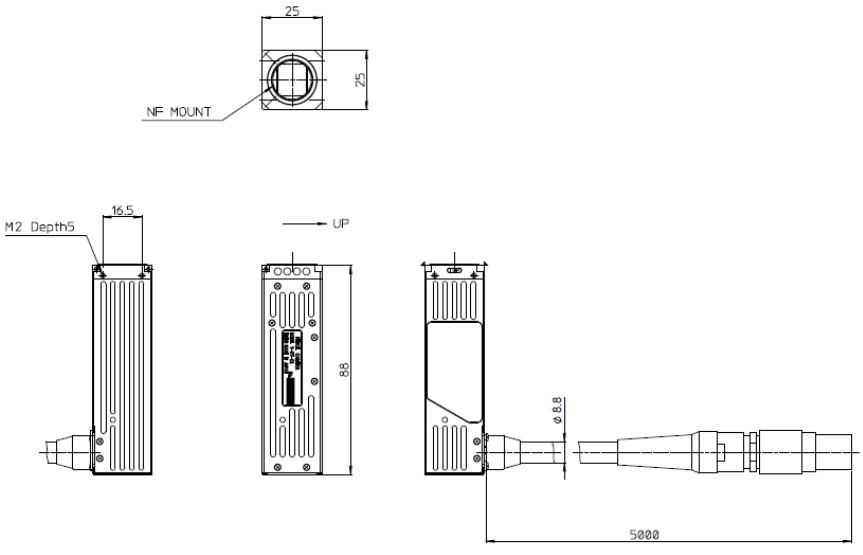


Figure 1-5 Camera Head Type SA

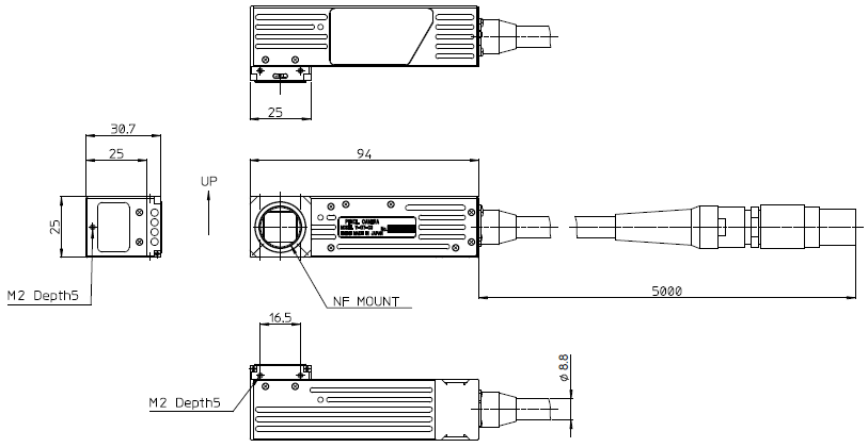


Figure 1-6 Camera Head Type AS

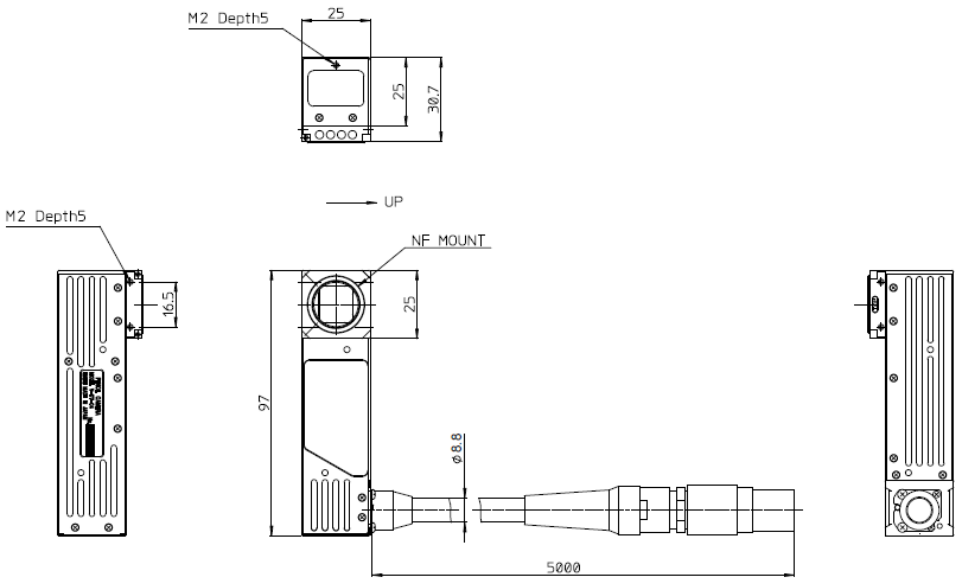


Figure 1-7 Camera Head Type AA

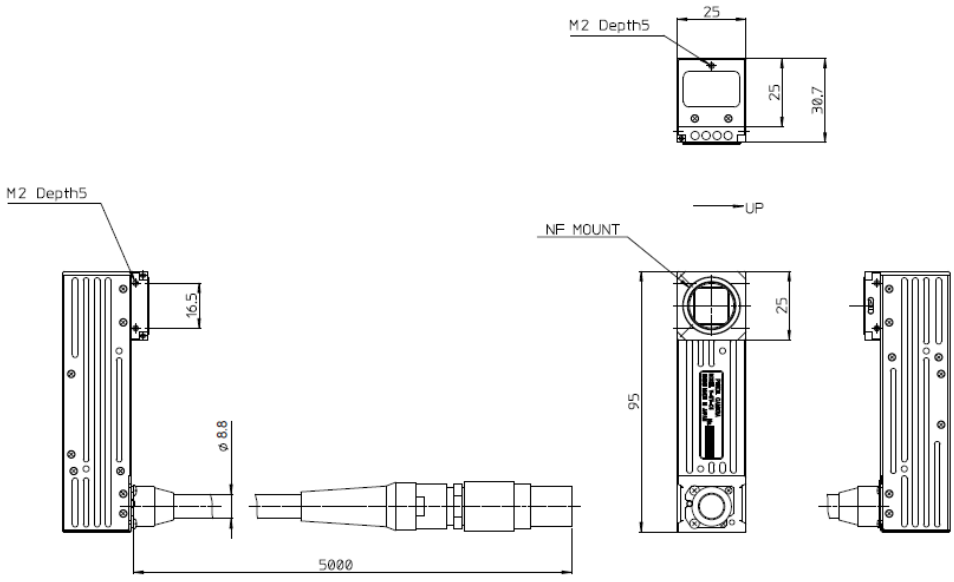


Figure 1-8 Camera Head Type AR

1.2.3 Camera Head Sensor

The sensor is shown below. (Figure 1-9)

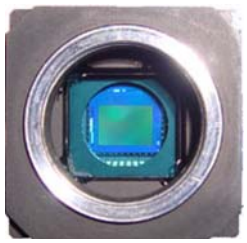


Figure 1-9 Sensor

Warning **Always replace the cap to protect the sensor when the camera head is not in use. Take care to avoid dirt or other contaminants from entering in contact with the sensor.**

1.2.3 Camera Head LED

There is an LED on the cable end of the camera head that shows its status.

LED Not Lit – Power Off

LED RED – Abnormality
(Signal: UNLOCK)

LED GREEN – Normal
(Signal: LOCK)

1.3 Cables

The Simple Cable Set J1, J2, J3 (Standard) which connects to the front panel is shown below. Please refer to **/ 7 / *Specifications / 7.5 – Input Output/Connector/ for*** additional details.

(J1) Simple Cable (Standard) - TRIG & STATUS

TRIG1

(J2) Simple Cable (Standard) - VF & J-PAD

ViewFinder (VF)

JPAD

USB

(J3) Simple Cable (Standard) - REMOTE

Ethernet

1.4 AC Adapter（Optional）

The exterior of the AC Adapter is shown below (Figure 1-13).

The output terminal of the AC Adapter has a special plug which connects to the ***PWR DC 20-32V/4.7-7.5A*** power connector on the front panel of the MEMRECAM GX-5.

The AC input terminal has a 3P plug and connects to an ***AC100V～240V*** power source.

Figure 1-13 AC Adapter

Warning **HIGH VOLTAGE. DO NOT OPEN THE COVER.**

Warning **When using a 3P-2P conversion plug to connect to a power outlet that lacks a frame ground, ensure that the grounding wire is connected to an external ground. If not grounded, electrical shock may occur from metal surfaces or other areas of this unit.**

Warning **This AC Adapter is a special part for the MEMRECAM GX-5 and should NOT be used with other devices.**

1.5 GXLink

The control software GXLink is provided on a CD-ROM (Figure 1-14).
Please refer to the **GXLink User's Manual** for additional details.

Figure 1-14 Control Software GXLink

2
Basic Operations

2.1 The Flow of Operations

There are three methods to operate the MEMRECAM GX-5 are as follows.

- **JPAD3 Remote Control**
- **GXLink Control Software**
- **External Input/Output signals**

This user's manual describes operation using the ***JPAD3 Remote Control*** and the ***External Input/Output signals*** are covered in the Specifications section.

Fugure 2-1 shows the flow of operations for basic recording, playback and storage. Settings using the JPAD3 are described in Chapters 3, 4 and 5.

Please refer to the **GXLink User's Manual** for additional details in using the GXLink control software. Please refer to ***/ 1 / Overview / 1.2.1 – Front Panel/ Input Ourput Connector/*** for additional details on the external input/output signals.

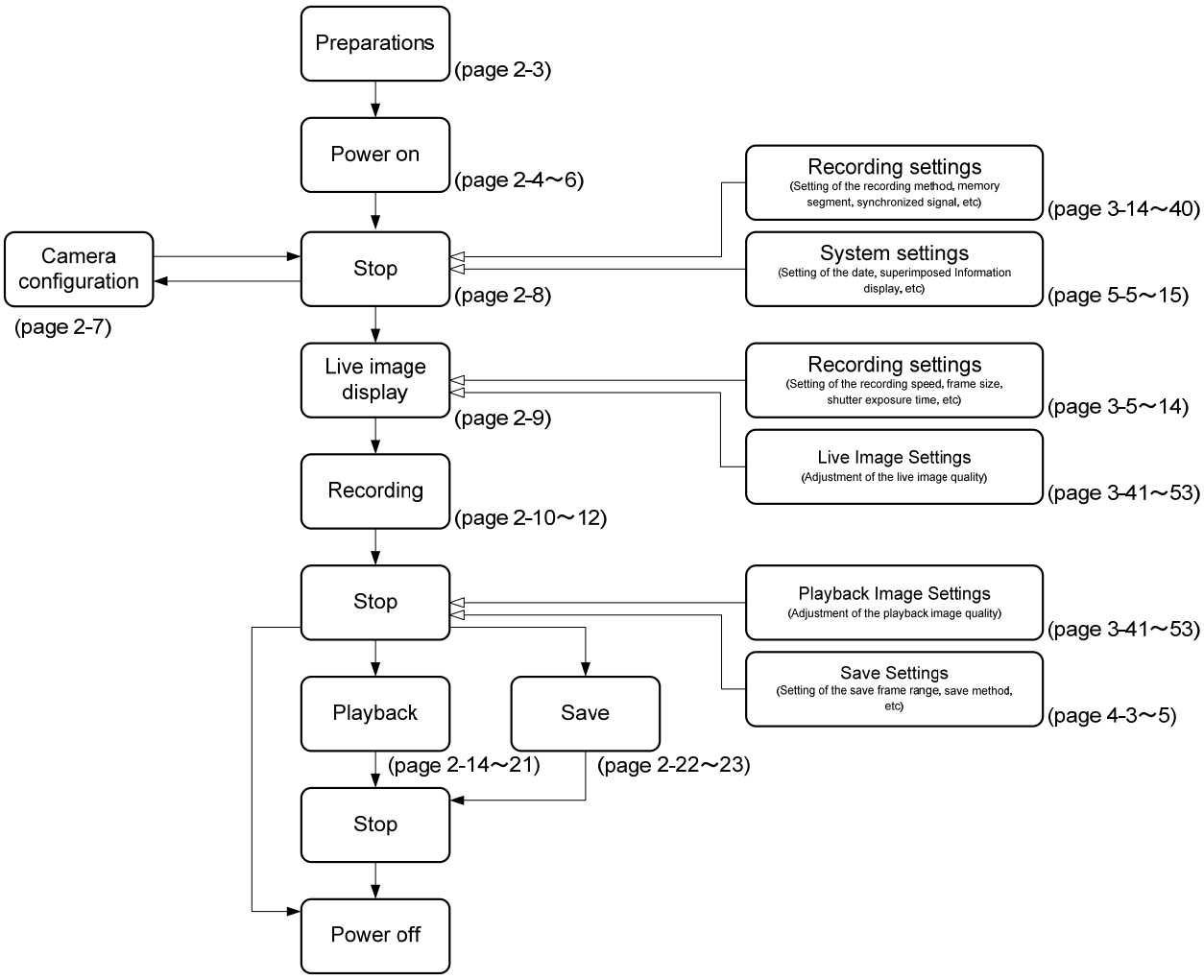


Figure 2-1 Flow of operations

2.2 Preparations

Warning

Always turn the power OFF when connecting and disconnecting camera heads. It is possible to damage the electronics and/or electric shock.

Prepare the devices shown in Table 2-1 and connect as shown in Figure 2-2.

Table 2-1 Devices to Prepare

Part	Model	Notes
MEMRECAM GX-5 DRP	V-338	Standard
J1 simple cable	584592	Standard (Used ONLY with MEMRECAM GX-5)
J2 simple cable	584258	Standard
J3 simple cable	584260	Standard
AC adapter	584541-1	Optional (**with** American type AC Plug)
	584541-2	Optional (**without** American type AC Plug)
Viewfinder Monitor	584367	Optional
Remote control JPAD3	584028	Optional
USB2.0 compatible storage media		
Control PC		Required when using the control software GXLink.

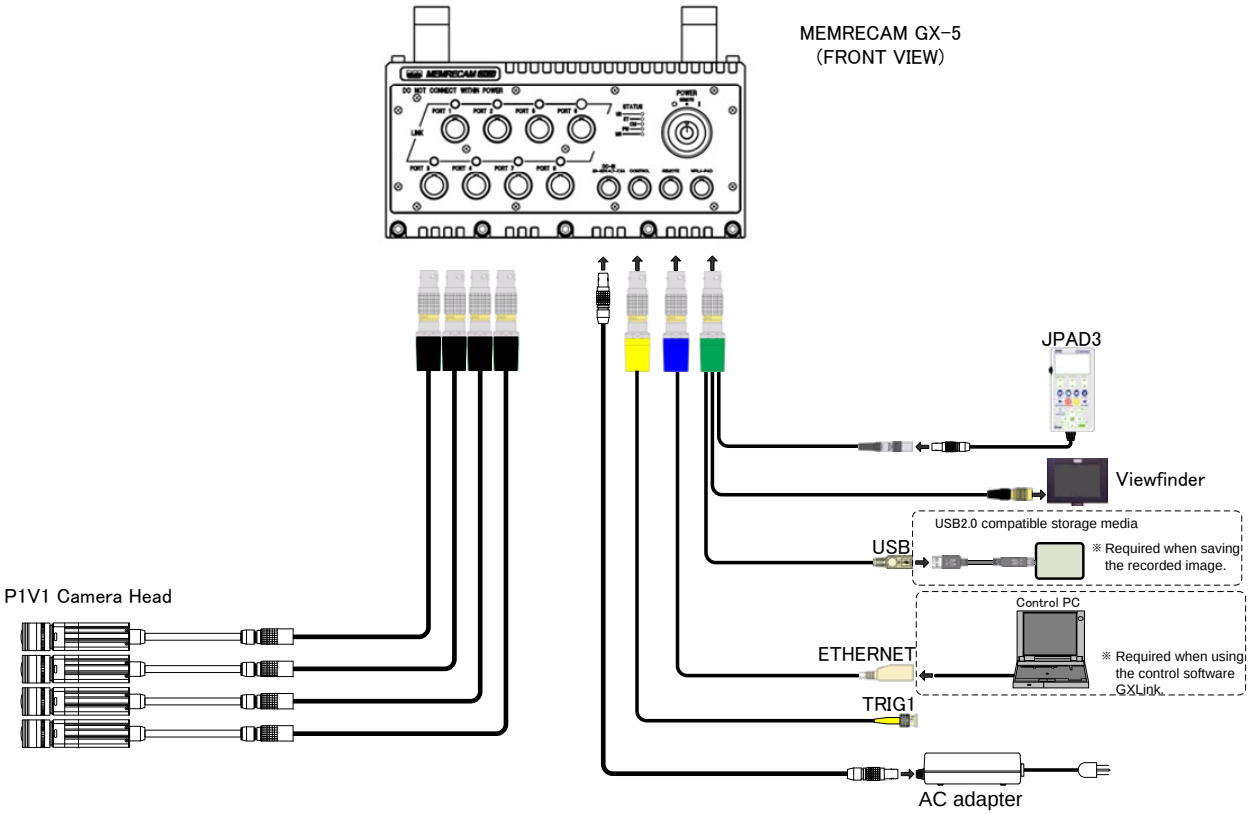
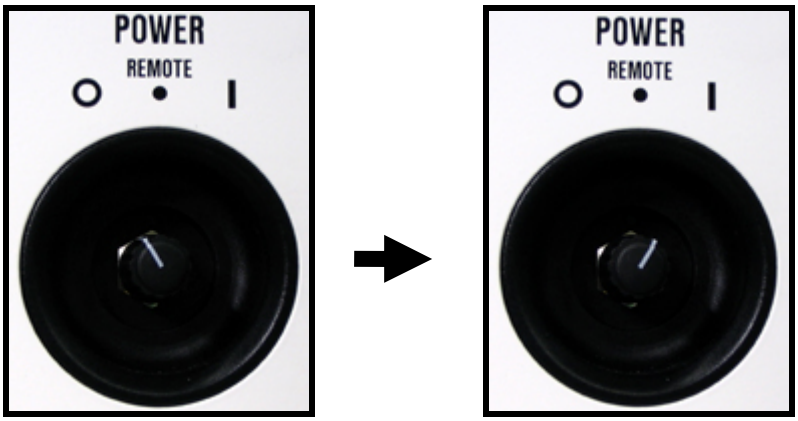


Figure 2-2 Connections for Each Device

2.3 Power

1. **Connect all the devices to the MEMRECAM GX-5 DRP before turning the power ON**.
2. Turn on the AC Adapter (power supply) or connect to a battery if used.
3. Turn the ON/OFF power switch ON
4. The MEMRECAM GX-5 starts up and enters STOP mode.



Power OFF **Power ON**

Figure 2-3 ON/OFF SWITCH

2.3.1 MEMRECAM GX-5 Startup Sequence

■Viewfinder Image Display

1. Turn the ON/OFF power switch ON.
2. Ensure that the Viewfinder power switch is turned ON to display the *Initial Screen* (Figure 2-4).

Figure 2-4 Initial Screen

3. After a few moments, the *System Information Screen* is shown (Figure 2-5). The yellow progress bar shows the camera's diagnostics sequence status.

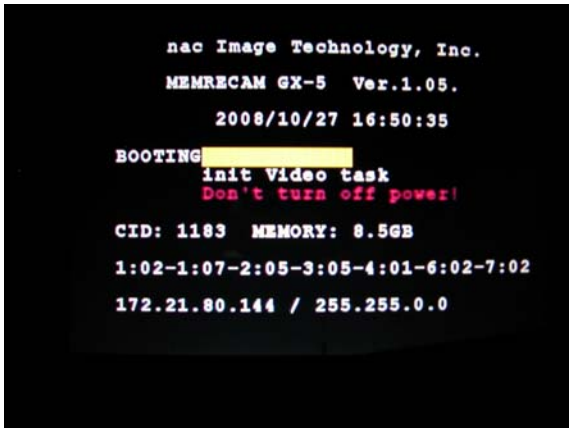


Figure 2-5 System Information Screen

Warning

It may take some time to complete the startup sequence and diagnostics. **DO NOT turn the power OFF while the progress bar is displayed (Figure 2-5)**. **It is possible for the nonvolatile memory in DRP to be destroyed.**

4. After the diagnostics sequence is complete, the MEMRECAM GX-5 enters STOP mode. Nine information areas are superimposed at the top and bottom of the screen (Figure 2-6).

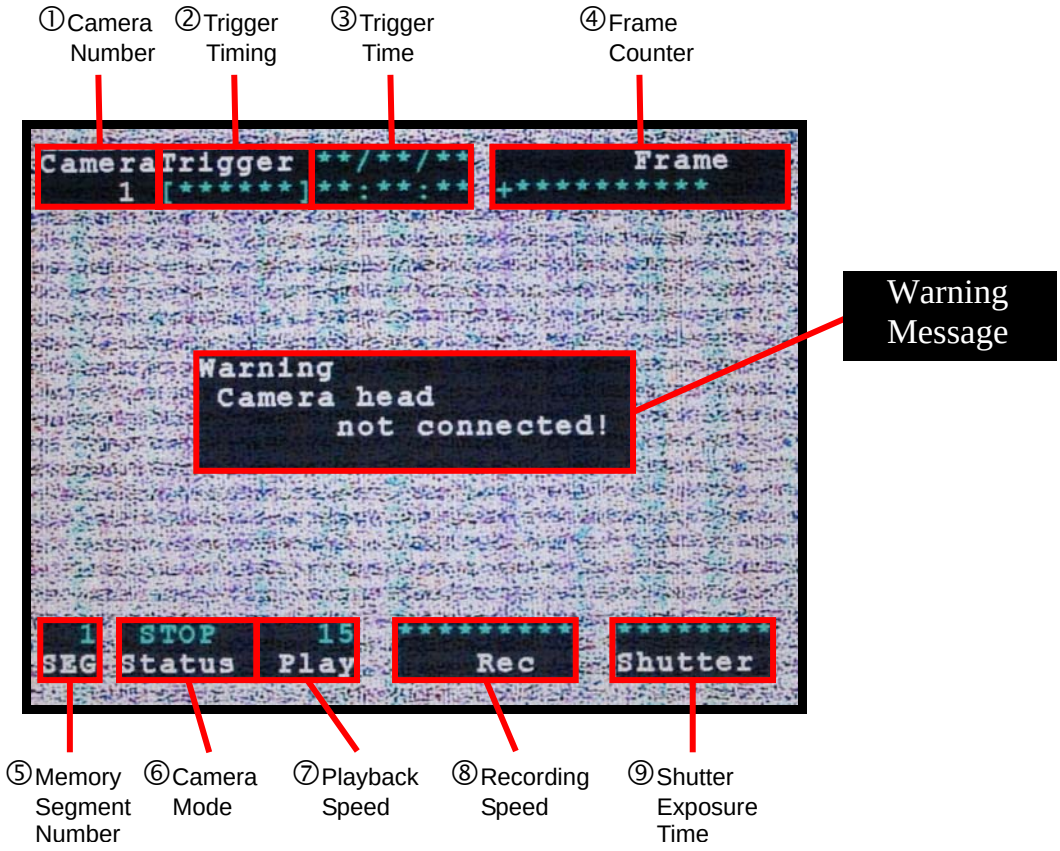


Figure 2-6 STOP Mode

Important

If there is an image in memory being protected by the Memory Backup unit during startup, the previously recorded image is displayed. When an image has not been recorded, the image appears as in Figure 2-6

When the camera configuration is correct the system is ready to be used immediately after start up.

If the configuration is different than the cameras connected to the DRP, a *Warning* message is shown. If a warning message appears set the correct camera configuration using the JPAD3 or GXLink.

Please refer to */ 2 / Basic Operation / 2.4 – Camera Configuration Setting/* for additional details on using the JPAD3 to set the camera configuration.

Please refer to the GXLink manual on using GXLink to set the camera configuration.

■DRP Front Panel LED Display

1) After turning the power ON to the MEMRECAM GX-5, the DRP front panel LED will display as shown in Figure 2-7 ① and ② until the automatic diagnostics have been completed.
2) Once the MEMRECAM GX-5 starts up normally and enters the STOP mode, the DRP front panel LED will display that shown in Figure 2-7 ③.

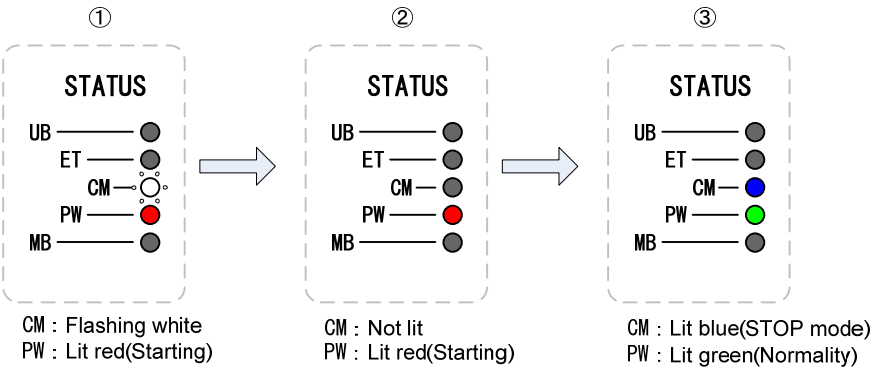


Figure 2-7 The DRP Front Panel LED Display at Startup

2.3.2 Remote Control JPAD3 Startup

1) After the MEMRECAM GX-5 power has been turned on, power is supplied to the remote control JPAD3. There is no power switch on the JPAD3 unit.

   The version information screen is shown on the JPAD3 LCD display. (Figure2-8)

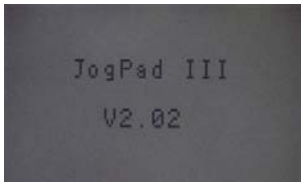


Figure 2-8 JPAD3 version information

2) After a few moments, it will switch to the status screen for the STOP mode and the 12 parameters are displayed. (Figure 2-9).

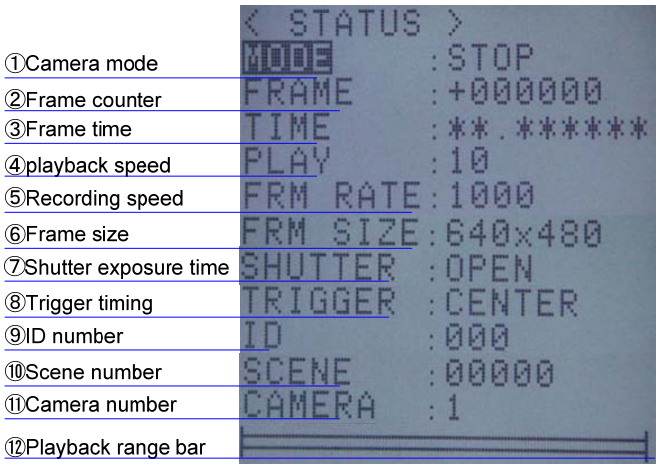


Figure 2-9 Status screen (STOP mode)

2.4 Camera Configuration Setup

In order to efficiently allocate system memory to each camera connected to the DRP, a camera configuration setup is required every time a camera is added or removed from use with the DRP. The port where the camera head is connected now becomes effective if the setting of the camera configuration is executed, and other ports become invalid.

Setup process for the camera configuration is shown in the following (Figure 2-10).

1. Press the MENU key (MENU) to JPAD3, and **TOP MENU** is opened.
2. Select the **SYS MENU** in **TOP MENU**, press the SET key (SET), and **SYS MENU** is opened.
3. Select the **SYS SET** in **SYS MENU**, press the SET key (SET), and **SYS SET** is opened.
4. Select the **CAMCFG** in **SYS SET**, press the SET key (SET). At this time, the message for the confirmation is displayed. Please push the SET key (SET) again.

After the procedure mentioned above, JPAD3 is rebooted, and the camera constitution of the system is set again.

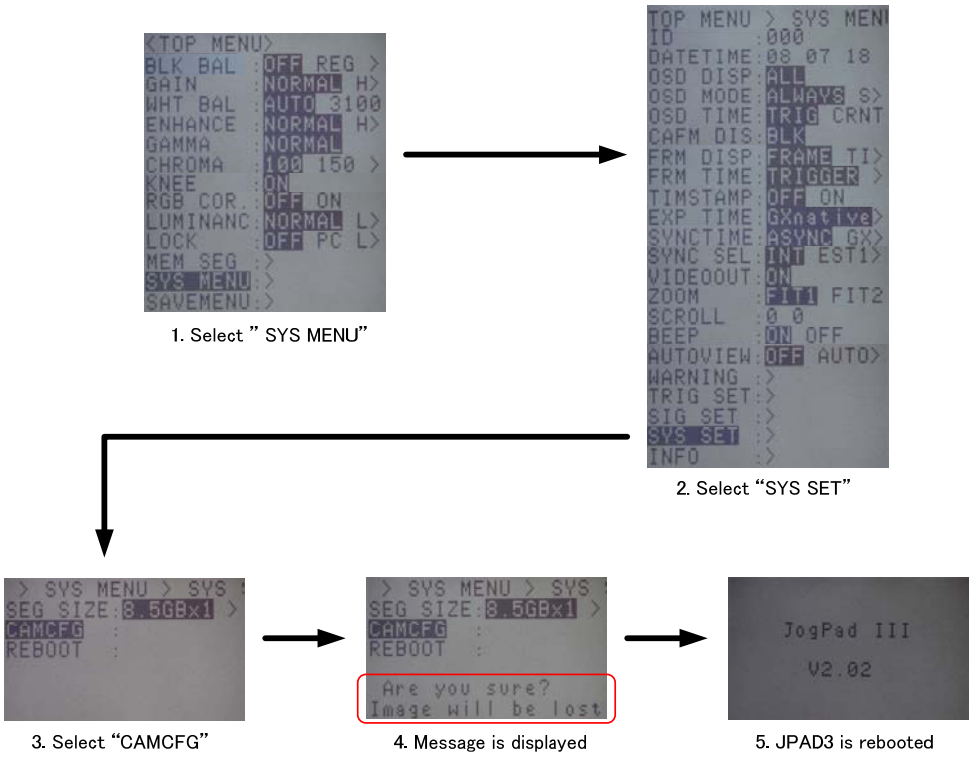


Figure 2-10 Camera Configuration Setup (JPAD3 Display)

Important

The image recorded in the memory is destroyed by changing the camera configuration setup. Change the camera configuration only after confirming if it is an image that can be erased.
Save the image in memory to an USB storage media or to a PC using GXLink before continuing.
Please refer to 【2.10 Saving 】 or 【 GXLink manual 】 for the saving method of an image.

2.5 Stop (STOP Mode)

■Switching to STOP Mode

Press the STOP button.

The MEMRECAM GX-5 normally starts up in the STOP mode. If operating in any modes other than STOP press the STOP button to stop operation and return to STOP mode.

Recording, playback and storage settings are configured while in STOP mode. Refer to **【3 Recording and Playback Settings】** and **【4 Save Settings】** for additional details.

By pressing the right and left keys it is possible to switch between cameras when two or more cameras are connected.

■Image Display

When the MEMRECAM GX-5 is first turned on the DRP enters STOP mode automatically after the startup sequence is complete. Nine information areas are superimposed at the top and bottom of the screen. The [Status] information box shows that the DRP is in **STOP** mode.

The superimposed information displayed in blue is information related to the image saved in the memory or playback information. "＊" are shown when the memory is empty.

The memory segment number [SEG] and the playback speed [Play] are shown whether or not there is an image recorded in memory.

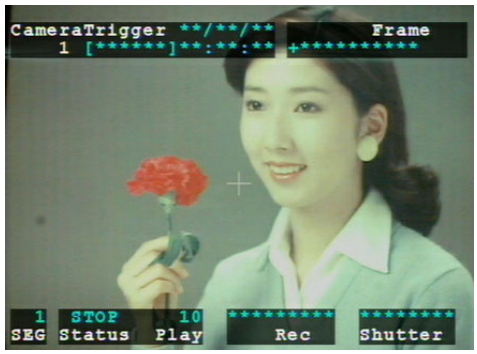


Figure 2-11 Image Display [STOP] mode

Important

If there is an image in memory being protected by the Memory Backup unit during startup, the previously recorded image is displayed after start up.

■JPAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **STOP** mode as in Figure 2-12. After startup, if the memory is empty, the factory default settings are shown on the <STATUS> screen. Since [TIME] information cannot be determined until recording has ended "＊" are shown. In addition the range bar is empty because there because there is no image in memory.

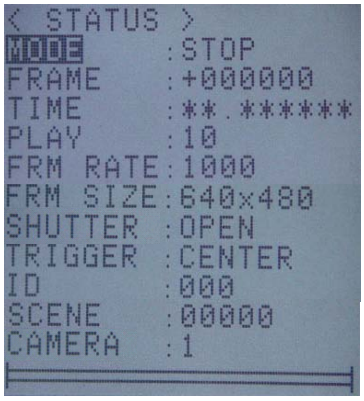


Figure 2-12 JPAD3 Display <STOP> mode

■Front Panel LED Display

During the STOP mode, the CM LED lights up blue.

2.6 Live Image Display (VIEW Mode)

■Switching to VIEW mode

Press the VIEW/ARM button.

VIEW mode can be accessed by pressing the VIEW/ARM button while in STOP mode.

The Record Settings are configured while in VIEW mode. Refer to **【3 Recording and Playback Settings】** for additional details.

By pressing the right and left keys it is possible to switch between cameras when two or more cameras are connected.

■Image Display

When the MEMRECAM GX-5 is in VIEW mode, the live image is shown on the video monitor (optional). The [STATUS] information box shows that the DRP is in **VIEW** mode (Figure 2-13).

The superimposed information in red shows the current record settings for the trigger [Trigger], frame rate [Rec] and shutter speed [Shutter]. If the record settings are changed, the live image and the superimposed information also changed.

The superimposed information for the trigger time and frame counter remain unchanged from the way they were in STOP mode.

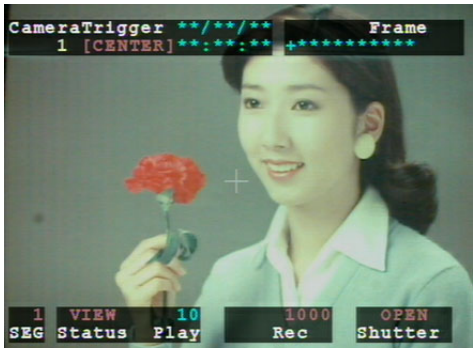


Figure 2-13 Image Display [VIEW] mode

■JPAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **VIEW** mode as in Figure 2-14. The current record settings are also shown. If the recording conditions are changed the JPAD 3 <STATUS> information is also changed.

The JPAD 3 <STATUS> information for the frame counter [FRAME] and frame time [TIME] remain unchanged from the way they were in STOP mode.

Since [TIME] information cannot be determined until recording has ended "∗" are shown.

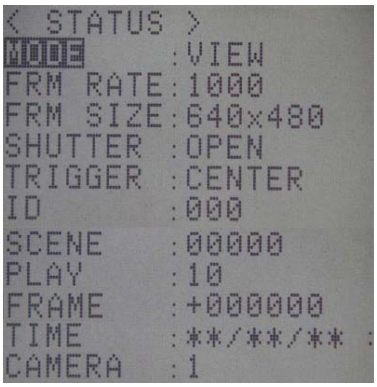


Figure 2-14 JPAD3 Display <VIEW> mode

■Front Panel LED Display

During the VIEW mode, the CM LED lights up white.

2.7 Recording

The MEMRECAM GX-5 memory is comprised of a ring buffer (circular memory) where the first recorded image and the last recorded image are connected while being stored to memory. When the recording starts the images are photographed and sequentially stored in the ring buffer (circular memory). After the ring buffer completes one cycle, each subsequent new image is overwritten. The images continue to be overwritten until the Trigger signal is received and the recording sequence is completed.

Change the camera modes using the remote control JPAD3 (Figure 2-15) to perform a recording sequence.

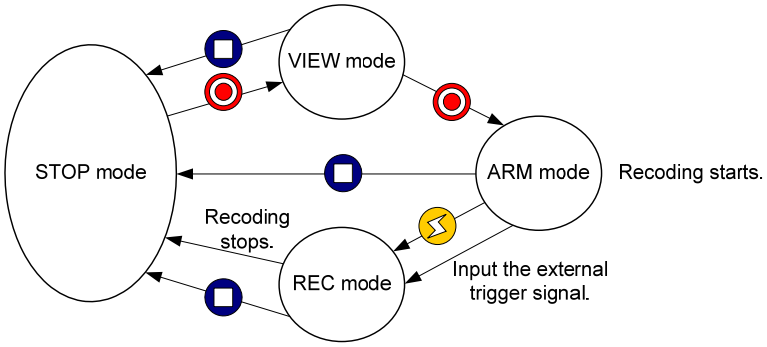


Figure 2-15 JPAD3 Record operation summary

2.7.1 ARM Mode

Warning

Before switching to ARM mode verify that the image stored in memory can be erased. Immediately upon switching to ARM mode the image stored in memory is overwritten by the new image being captured. Save the image in memory to an USB storage media or to a PC using GXLink before continuing. Please refer to 【2.10 Saving 】 or 【 GXLink manual 】 for additional information on saving images.

■Switching to ARM Mode

Press the VIEW/ARM button.

From VIEW mode, ARM mode can be accessed by pressing the VIEW/ARM button on the JPAD3.

While in ARM mode the Record Settings cannot be changed.

By pressing and the right and left key it is possible to switch between cameras when two or more cameras are connected.

■Image Display

When the MEMRECAM GX-5 is in ARM mode, the image being recorded is shown on the video monitor (optional). The [STATUS] information box shows that the DRP is in **ARM** mode (Figure 2-16).

Once recording starts, all of the superimposed information are shown in red.

After the trigger signal is received the frame number of the frame being saved is displayed in frame [Frame] information box. Depending on the trigger [Trigger] setting the amount of frames remaining to be recorded after the trigger signal change. Refer to **【3.2.1 Trigger Timing Selection】** for additional details.

Since [TIME] information cannot be determined until recording has ended "∗" are shown.

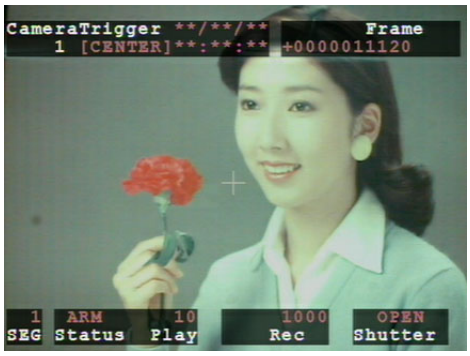


Figure 2-16 Image Display [ARM] mode

■JPAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **ARM** mode as in Figure 2-17. The record settings configured while in <VIEW> mode are shown. Record settings cannot be changed while in ARM mode.

Since [TIME] information cannot be determined until recording has ended "∗" are shown. In addition "0" is shown for the frame counter <FRAME> until recording has ended.

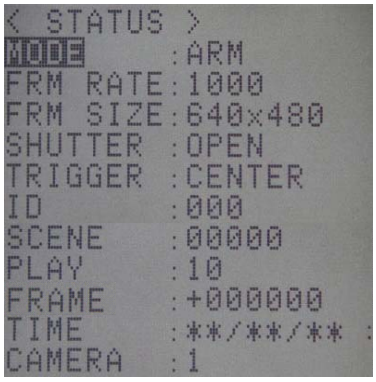


Figure 2-17 JPAD3 Display <ARM> mode

■Front Panel LED Display

During the ARM mode, the CM LED lights up magenta.

2.7.2 REC Mode

■Switching to REC Mode

Press the TRIG button - or - an external trigger input signal is received

From ARM mode, REC mode can be accessed by pressing the TRIG button or an external trigger signal is received on the J1 cable, TRIG1 branch. Refer to **【3.2.12 External Trigger Signal Selection】** for additional information on external trigger inputs.

Once in REC mode, the recording ends according to the set trigger timing. Refer to **【3.2.1 Trigger Timing Selection】** for additional details on trigger timing.

Once the recording ends, the unit automatically returns to STOP mode.

■Image Display

When the MEMRECAM GX-5 is in REC mode, the image being recorded is shown on the video monitor (optional). The [STATUS] information box shows that the DRP is in **REC** mode (Figure 2-18).

After the trigger signal is received the frame number of the frame being saved is displayed in frame [Frame] information box. Depending on the trigger [Trigger] setting the amount of frames remaining to be recorded after the trigger signal change. Refer to **【3.2.1 Trigger Timing Selection】** for additional details.

Since [TIME] information cannot be determined until recording has ended "∗" are shown.

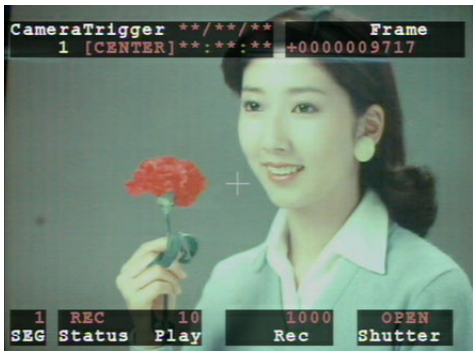


Figure 2-18 Image Display [REC] mode

■JPAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **REC** mode as in Figure 2-19. The record settings configured while in <VIEW> mode are shown. Record settings cannot be changed while in ARM mode.

Since [TIME] information cannot be determined until recording has ended "∗" are shown. In addition "0" is shown for the frame counter <FRAME> until recording has ended.

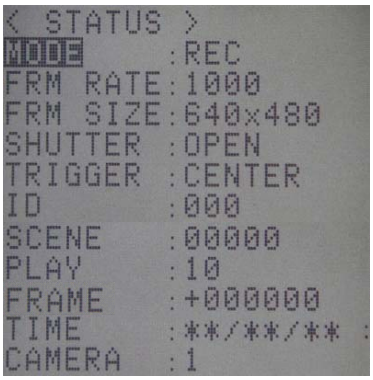


Figure 2-19 JPAD3 Display <REC> mode

■Front Panel LED Display

During the REC mode, the CM LED lights up orange.

2.8 Memory Backup

Once recording ends, the unit automatically returns to STOP mode. At the same time, the memory backup function activates (Figure 2-20). The status of the memory backup can be verified by the rear panel LED display (Table 2-2). Therefore, in the event that the external power is cut off after the recording is complete, the images saved in the memory are preserved (Figure 2-21). The memory backup function does not operate the camera while recording.

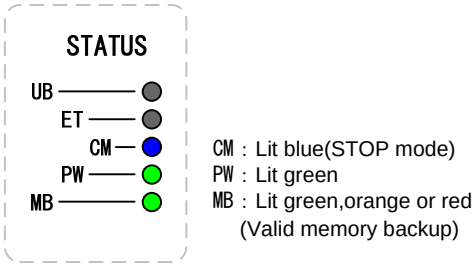


Figure 2-20 Memory Backup with External Power

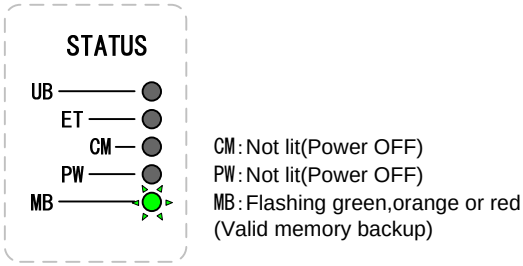


Figure 2-21 Memory Backup without External Power

Table 2-2 Memory Backup Status Display with MB LED

MB LED (Memory Backup)	GREEN (Lit) **with External Power**	Valid memory backup, **Charge: High**
	GREEN (Flashing) **with Battery Power**	Valid memory backup, **Charge: High**
	GREEN (Lit) **with External Power**	Valid memory backup, **Charge: Medium**
	GREEN (Flashing) **with Battery Power**	Valid memory backup, **Charge: Medium**
	GREEN (Lit) **with External Power**	Valid memory backup, **Charge: Low** (backing up with External Power)
	GREEN (Flashing) **with Battery Power**	Valid memory backup, **Charge: Low** (backing up with Battery)
	Not lit	No memory backup data

Important

The amount of charge is impacted by differences in the batteries and ambient temperature. Use the LED indications only as a guide since it may not be precise.

Warning

If the LED color turns from **Flashing ORANGE** to **Flashing RED** during battery backup, charge the battery as soon as possible! If the battery is not charge, the battery backup function will de-activate and the images will be lost!

Connect the MEMRECAM GX-5 DRP to a reliable external power source (e.g. AC adapter). **Do no rely on an external battery power source.**

2.9 Playback

Recorded images can be played back as follows:

- ***PLAY Mode*** - Single sequence playback
- ***LOOP Mode*** - Loop playback
- Playback at ***Varying Speeds***
- ***Skip Forward*** / ***Fast Forward*** / ***Rewind***
- ***Frame Jumping***
- Set ***Playback Range***

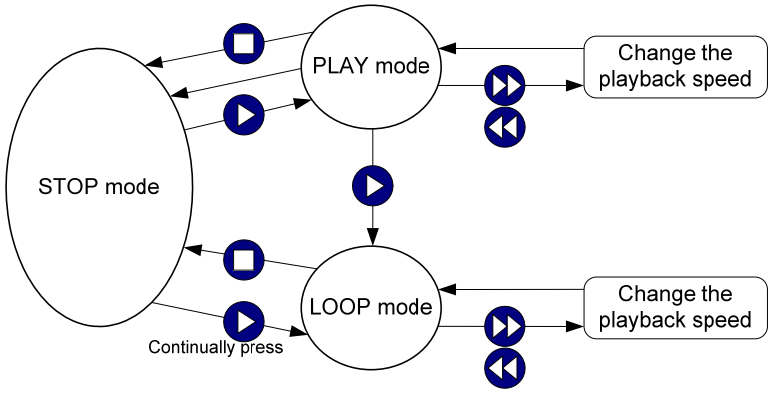


Figure 2-22 JPAD3 Playback operation summary

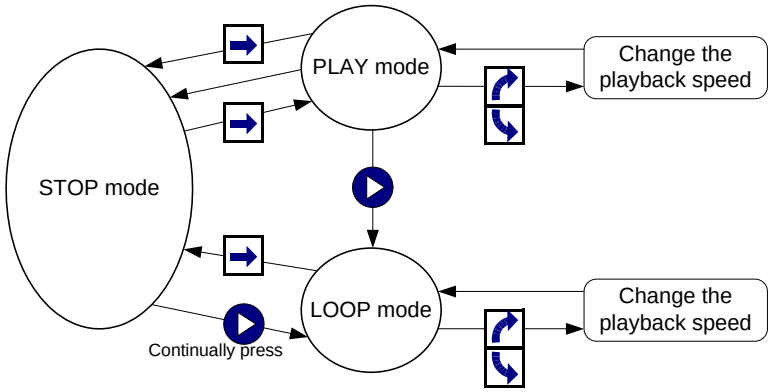
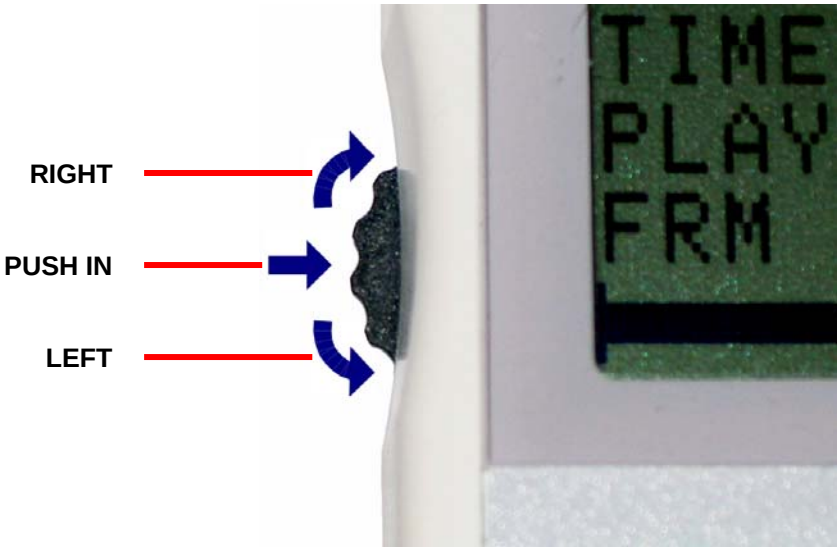


Figure 2-23 JPAD3 Playback operation summary (using the dial)



2.9.1 PLAY Mode - Single Sequence Playback

■Switching to PLAY mode

Press the PLAY button - or - push the Dial in

From STOP mode, PLAY mode can be accessed by pressing the PLAY button or pushing the dial in. Recorded images are played back sequentially. With Single Sequence Playback mode the images within a range are shown one time. When it reaches the end of the range the unit automatically returns to STOP mode.

To exit PLAY mode press the STOP button or wait until the image sequence reached the end.

■Image Display

While in PLAY mode, the recorded image is played back sequentially. The [STATUS] information box shows that the DRP is in **PLAY** mode (Figure 2-24). The [Frame] information box shows the frame number for each image.

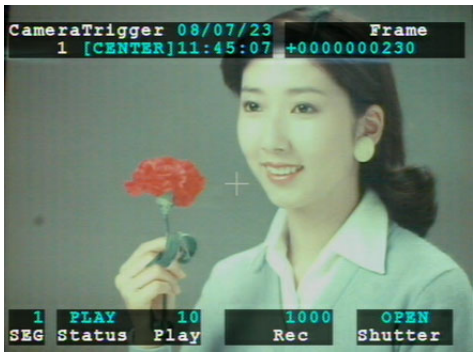


Figure 2-24 Image Display [PLAY] mode

■JPAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **PLAY** mode as in Figure 2-25. The record settings used while recording the image are shown.

<FRAME> shows the frame number for each image.
<TIME> shows the recording time for each image.

While in PLAY mode the playback range bar is shown at the bottom of the <STATUS> display. A mark shows the position of the current frame in relation to the playback range.

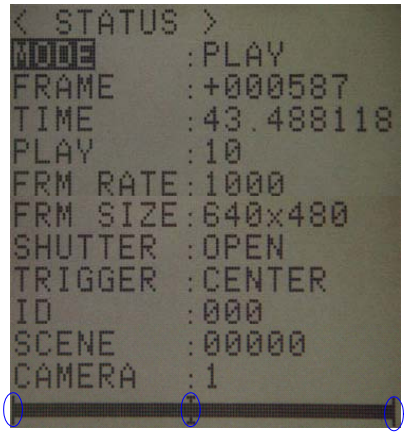


Figure 2-25 JPAD3 Display <PLAY> mode

2.9.2 LOOP Mode - Loop Playback

■ Switching to LOOP mode

Hold down the PLAY button – or – press the PLAY button twice

From STOP mode, LOOP mode can be accessed by holding down the PLAY button or pressing the PLAY button twice. The Recorded images are played back continuously in a loop. If a playback range has been set, only the portion of the image within the range is played back continuously in a loop.

To stop loop playback, press the STOP button or push the dial in.

■Image Display

While in LOOP mode, the recorded image is played back in a loop. The [STATUS] information box shows that the DRP is in LOOP mode (Figure 2-26). The [Frame] information box shows the frame number for each image.

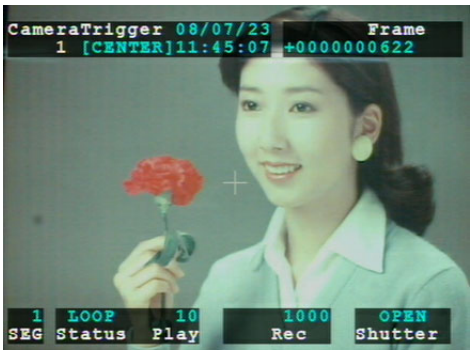


Figure 2-26 Image Display [LOOP] mode

■JPAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **LOOP** mode as in Figure 2-27. The record settings used while recording the image are shown.

<FRAME> shows the frame number for each image.
<TIME> shows the recording time for each image.

While in PLAY mode the playback range bar is shown at the bottom of the <STATUS> display. A mark shows the position of the current frame in relation to the playback range. When the mark reaches the end of the range it jumps to the beginning of the range.

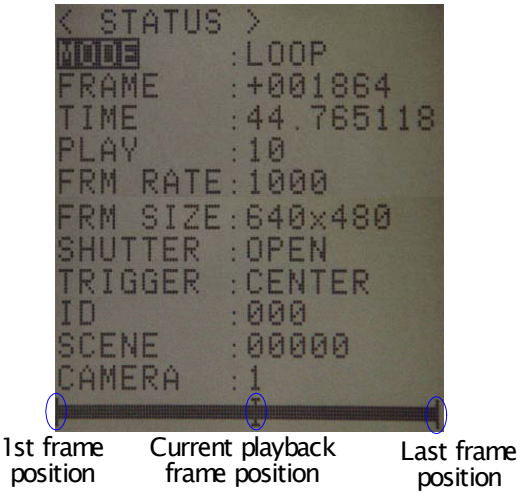


Figure 2-27 JPAD3 Display <LOOP> mode

2.9.3 Playback at Varying Speeds

While in **PLAY** or **LOOP** mode, press the **REV** - or - **FWD** buttons to change the playback speed (Figure 2-22, 23). Each operation is shown in Table 2-3.

Table 2-3 Changing Playback Speeds

Playback Speed Change	JPAD3 Button Operation
(Forward) Slow Down **(Reverse)** Speed Up	While in **Forward** playback press **REV** to slowdown the image playback While in **Reverse** playback press **REV** to speedup the image playback
(Forward) go in Reverse	While in **Forward** playback press **REV** several times to play the image backwards (Reverse)
(Reverse) Slow Down **(Forward)** Speed Up	While in **Reverse** playback press **FWD** to slowdown the image playback While in **Forward** playback press **FWD** to speedup the image playback
(Reverse) go Forward	While in **Reverse** playback press **FWD** several times to play the image backwards (Reverse)

The available playback speeds can vary depending on the video output. Table 2-4 shows the playback speeds for NTSC and PAL video outputs. Refer to **【5 System Setting】** for additional details on setting the video output.

Table 2-4 Playback Speeds that can be Set (NTSC/PAL)

Video Output Method	Playback Speed (pps)
NTSC	-1920, -960, -480, -240, -120, -60, -30, -15, -10, -5, -2, -1, 1, 2, 5, 10, 15, 30, 60, 120, 240, 480, 960, 1920
PAL	-2000, -1000, -800, -400, -200, -100, -50, -25, -10, -5, -2, -1, 1, 2, 5, 10, 25, 50, 100, 200, 400, 800, 1000, 2000

2.9.4 Skip Forward, Fast Forward, Skip Backward and Rewind

While in STOP mode press the **REV** - or – **FWD** buttons or turn the dial to the **RIGHT** or **LEFT** to Skip Forward, Fast Forward, Skip Backward and Rewind. Table 2-5 shows each operation.

Table 2-5 Skip Forward, Fast Forward, Skip Backward and Rewind

Operation	JPAD 3 Button Operation	JPAD3 Dial Operation
Skip Forwards	Press the **FWD** button once.	Turn dial to the **RIGHT**
Skip Backwards	Press the **REV** button once.	Turn dial to the **LEFT**
Fast Forward	Hold down the **FWD** button Release to stop.	**Push** the dial while turning to the **RIGHT** + Release to stop.
Rewind	Hold down the **REV** button Release to stop.	**Push** the dial while turning to the **LEFT** + Release to stop.

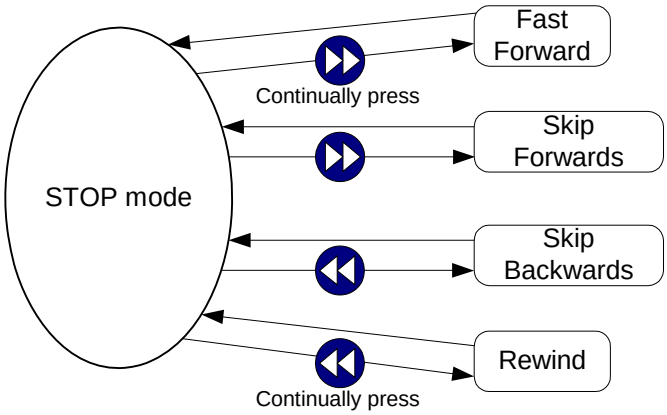


Figure 2-28 Skip Forward, Fast Forward, Skip Backwards and Rewind using the JPAD3

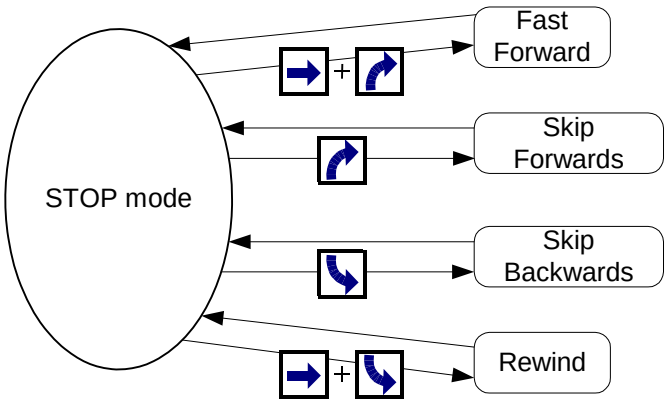


Figure 2-29 Skip Forward, Fast Forward, Skip Backwards and Rewind using the JPAD3 dial

2.9.5 Frame Jumping

While in STOP mode press the **TRIG**, **REV**, **FWD** buttons or turn the dial to the **RIGHT** or turn the dial to the **LEFT** to jump to a particular frame. The operation to Jump to a Frame is shown in Table 2-6.

Table 2-6 Frame Jumping

Jump to	JPAD3 Button Operation	JPAD3 Dial Operation
1st frame	Press **TRIG** while pressing **REV**	Press **TRIG** while turning the dial to the **LEFT**
Trigger frame	Press **TRIG**	
Last frame	Press **TRIG** while pressing **FWD**	Press **TRIG** while turning the dial to the **RIGHT**
Event frame	Press **TRIG**	

- With burst recorded images, press TRIG to sequentially jump to the top frame where the burst trigger was input.
- With multi trigger recorded images, press TRIG to sequentially jump to the trigger frame for each block.

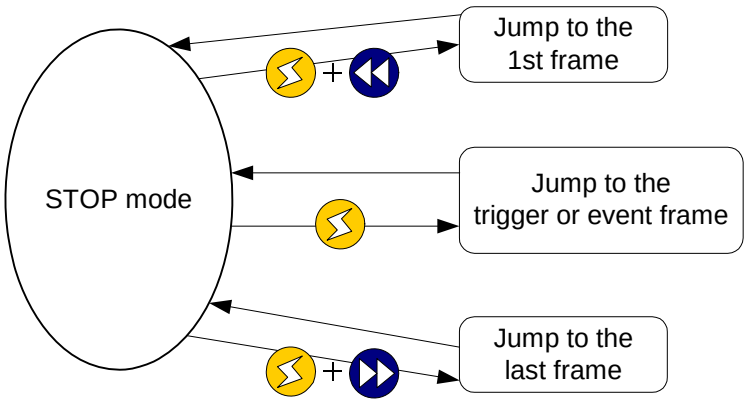


Figure 2-30 Frame Jumping Using the JPAD3

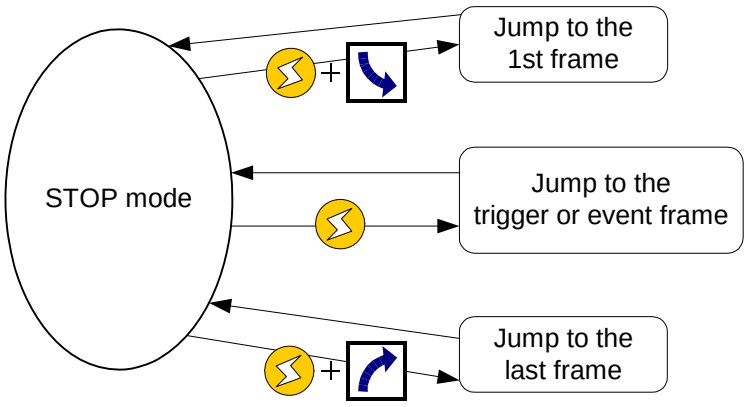


Figure 2-31 Frame Jumping Using the JPAD3 (Using the Dial)

2.9.6 Setting the Playback Range

While in **STOP** mode press the **S.STEP**, **E.SET** buttons to set the Starting and Ending playback range. As an alternative press the **STOP** and turn the dial to the **RIGHT** or **LEFT** to set the playback range. The operations to set the Starting and Ending playback range are shown in Table 2-7.

Table 2-7 Playback Range Settings

Jump to	JPAD3 Button Operation	JPAD3 Dial Operation
Set starting playback frame	Press **S.SET**	Press **STOP** while turning the dial to the **LEFT**
Set ending playback frame	Press **E.SET**	Press **STOP** while turning the dial to the **RIGHT**
Delete starting playback frame	Press and hold down **S.SET**	
Delete ending playback frame	Press and hold down **E.SET**	
Delete playback range		Press **STOP** while pushing the dial in.

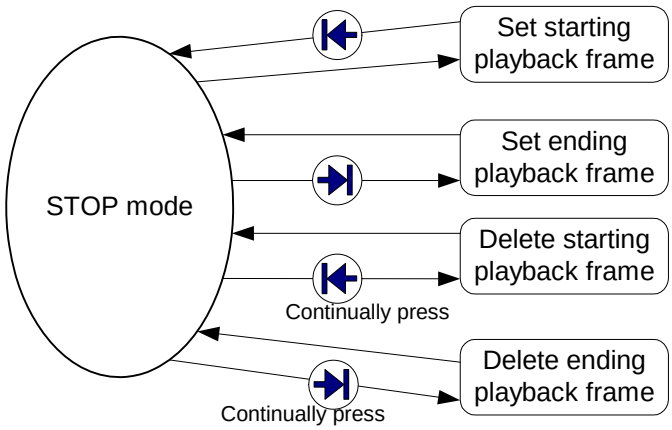


Figure 2-32 Playback Range Settings Using the JPAD3

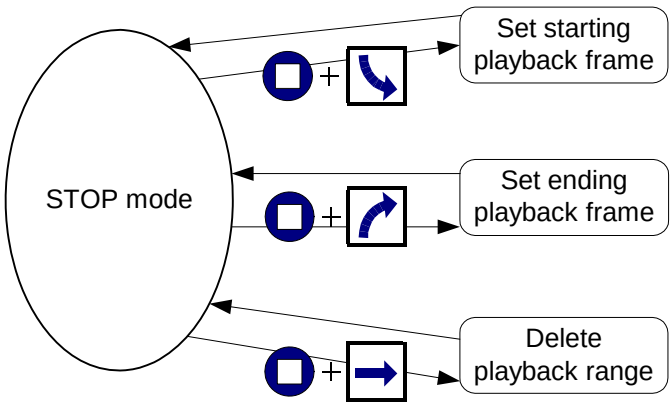


Figure 2-33 Playback Range Settings Using the JPAD3 (Using the Dial)

■ Playback Range – Video Display

Below is the procedure for setting the playback starting and ending frame.

1) While in **STOP** mode, search for the start frame by pressing the **FWD** or **REV** buttons.
2) To set the starting frame, press the **S.SET** button. As an alternative press the **STOP** and turn the dial to the **LEFT**. The video display will show **[Frame** to indicate that the starting frame has been set. Press and hold down the S.SET button to delete the playback range setting.

3) While in **STOP** mode, search for the end frame by pressing the **FWD** or **REV** buttons.
4) To set the end frame, press the **E.SET** button. As an alternative press the **STOP** and turn the dial to the **RIGHT**. The video display will show **[Frame]** to indicate that the starting frame has been set. Press and hold down the E.SET button to delete the playback range setting.

■ Playback Range – JPAD3 Display

The playback range that has been set appears as a black region within the playback range bar on the JPAD3 <STATUS> screen (Figure 2-34).

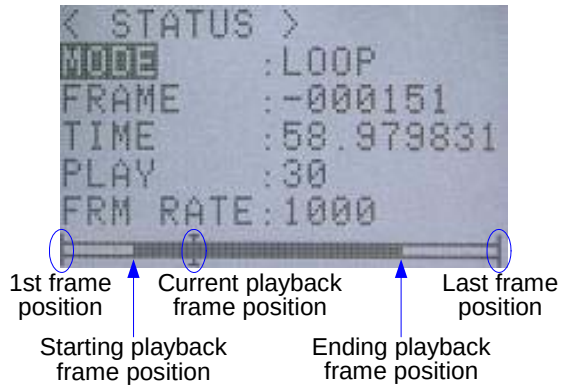


Figure 2-34 JPAD3 Display (During Playback Range Loop Playback)

※ The frame jumping function is not available for the set playback beginning and ending frames.

■ Playback of Frames outside of the Playback Range

After setting the playback range it is possible to view the frames outside the Set Playback Range by pressing the FWD or REV while in STOP mode.

If viewing an image before the set Start frame the frame counter shows **< Frame]** indicating that the image is beyond the beginning of the range.

If viewing an image after the set Start frame the frame counter shows **[Frame >** indicating that the image is beyond the end of the range.

2.10 Saving

When saving images directly from the camera to an USB compatible storage media, connect it to the USB connector on the J2 cable and follow this procedure. Use the direct download key on the JPAD3. All of the recorded frames are saved as a MEMRECAM video file (MCFF). For additional details on saving settings refer to【**4 Save Settings**】.

Important

When saving with the JPAD3, only the image of the camera head that has been selected is saved. When downloading the images from several camera heads, select the desired camera first and then download to the USB device. Use GXLink to perform batch downloads. Please refer to the【 GXLink manual 】for additional details.

1) After recording the DRP returns to STOP mode.

2) While in STOP mode, connect the USB2.0 compatible storage media device to the J2 cable. Once the storage device is connected, the UB LED on the front panel lights up green.

3) Press JPAD3 **DOWNLOAD** (DOWNLOAD) button to display the Transmit mode screen.（Figure 2-35）

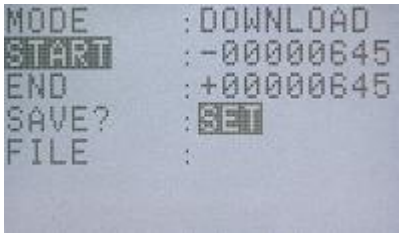


Figure 2-35 Transmit mode screen

Important

The start frame (START) and end frame (END) of the range to be saved will be displayed but cannot be changed. Refer to【**4 Save Settings**】for additional details on setting the save range.

4) The **SAVE?** question will be flashing "**SET**". Press the **SET** (SET) button to acknowledge and start saving.

The file name "MCFF0000.MCF" is automatically assigned (Figure 2-36). When saving multiple images, the next file name will be incremented +1 (i.e. "MCFF0001.MCF") and so on. A progress bar is shown at the bottom of the screen indicating the saving status.

Figure 2-36 Start Download

Important

If there is insufficient space in the storage media for the range of frames to be saved, the images will not be saved. Refer to【**4 Save Settings**】to verify the number of frames that can be saved.

5) Once the download is complete, "COMPLETE" will be shown, as in Figure 2-37. "SET" will be flashing again. Press JPAD3 SET (SET) to finish saving the images.

6) Before removing the storage media ensure that the BU LED is not lit.

Figure 2-37 Finish Download

Important

Saved video files (MCFF) cannot be reloaded on the MEMRECAM GX-5. Saved files can be verified using the GXLink control software. Refer to 【**GXLink User's Manual**】for the method to verify saved files.

3

Recording and Playback Settings

3.1 Settings

The JPAD3 remote control can be used to set various recording and playback settings. There are three menu groups to enter these settings.

- **TOP MENU**
- **SYS MENU**
- **VIEW MENU**

3.1.1 TOP MENU Settings

■ Switching to the TOP MENU

From STOP mode, press the MENU button to switch from the <STATUS> screen to the <TOP MENU> (Figure 3-1).

■ Exit the TOP MENU

Press STOP or MENU to return to the <STATUS> screen (STOP mode).

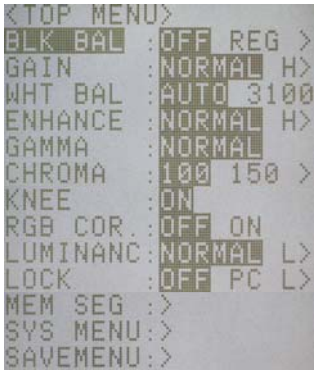


Figure 3-1 TOP MENU

Table 3-1 TOP MENU Settings

Settings	Setting Details	
BLK BAL	Black balance	Refer to this Chapter
GAIN	Gain adjustment of playback image	Refer to this Chapter
WHT BAL	White balance of playback image	Refer to this Chapter
ENHANCE	Enhance correction of playback image	Refer to this Chapter
GAMMA	Gamma correction of playback image	Refer to this Chapter
CHROMA	Chroma adjustment of playback image	Refer to this Chapter
KNEE	Knee adjustment of playback image	Refer to this Chapter
RGB COR.	RGB matrix adjustment of playback image	Refer to this Chapter
LUMINANC	Brightness characteristics settings of playback image	Refer to this Chapter
LOCK	PC operation lock setting	Refer to Chapter 【5 System Settings】
MEM SEG	Select the playback memory segment number	Refer to this Chapter
SYS MENU	Jump to the SYS MENU	Refer to this Chapter
SAVE MENU	Jump to the SAVE MENU	Refer to Chapter 【4 Save Settings】

3.1.2 SYS MENU Settings

■ Switching to the SYS MENU

From STOP mode, press the MENU button to switch from the <STATUS> screen to the <TOP MENU>. Use the UP/DOWN arrows to select <SYS MENU> press SET to display the SYS MENU (Figure 3-2).

■ Exit the SYS MENU

Press STOP or MENU to return to the <STATUS> screen (STOP mode). It is possible to return to the <TOP MENU> by selecting <TOP MENU > SYS MEN> at the top of the SYS MENU and pressing SET.

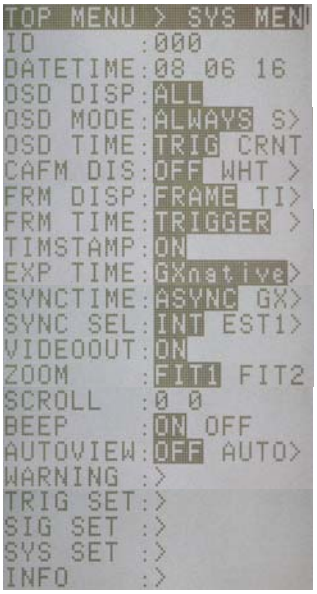


Figure 3-2 SYS MENU

Table 3-2 SYS MENU Settings

Settings	Setting Details	
ID	ID number setting	Refer to Chapter 【5 System
DATETIME	Date and time setting	Refer to Chapter 【5 System
OSD DISP	Display/do not display superimposed information	Refer to Chapter 【5 System
OSD MODE	Display/do not display superimposed information by camera	Refer to Chapter 【5 System
OSD TIME	Trigger time display setting	Refer to Chapter 【5 System
CAFM DIS	Display/do not display mark for center of image	Refer to Chapter 【5 System
FRM DISP	Frame counter display setting	Refer to Chapter 【5 System
FRM TIME	Frame time standard setting	Refer to Chapter 【5 System
TIMSTAMP	Time stamp record setting	Refer to this Chapter
EXP TIME	Exposture timing setting	Refer to this Chapter
SYNC TIME	Synchronized time setting	Refer to this Chapter
SYNC SEL	Synchronized signal setting	Refer to this Chapter
VIDEOOUT	Display/do not display image	Refer to Chapter 【5 System
ZOOM	Zoom playback image	Refer to this Chapter
SCROOL	Scroll playback image	Refer to this Chapter
BEEP	Remote control operation sound ON/OFF	Refer to Chapter 【5 System
AUTOVIEW	Automatic switch to VIEW mode	Refer to Chapter 【5 System
WARNING	Display/do not display warnings	Refer to Chapter 【5 System
TRIG SET	External trigger setting, recording method setting	Refer to this Chapter
SIG SET	External input/output signal polarity setting	Refer to this Chapter
SYS SET	Segment memory setting, reboot	Refer to this Chapter
INFO	System information display (cannot be set)	Refer to Chapter 【5 System

3.1.3 VIEW MENU Settings

■ Switching to VIEW MENU

From VIEW mode, press the MENU button to switch from the <STATUS> screen to the <VIEW MENU> (Figure 3-3).

■ Exit VIEW MENU

Press STOP or MENU to return to the <STATUS> screen (VIEW mode).

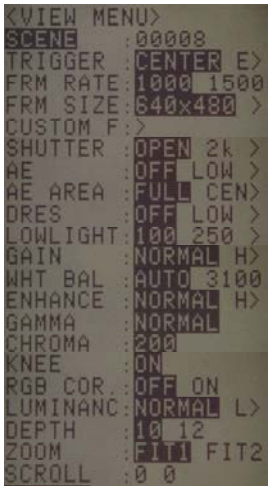


Figure 3-3 VIEW MENU

Table 3-3 VIEW MENU Settings

Settings	Setting Details	
SCENE	Recording scene number setting	
TRIGGER	Trigger timing setting	Can be set with the direct key
FRM RATE	Recording speed setting	Can be set with the direct key
FRM SIZE	Frame size setting	
CUSTOM F	Recording speed, frame size custom setting	
SHUTTER	Shutter exposure time setting	Can be set with the direct key
AE	Automatic exposure setting	
AE AREA	Automatic exposure area measurement setting	
DRES	DRES mode setting	
LOWLIGHT	Low light mode setting	
GAIN	Gain adjustment of live image	
WHT BAL	White balance of live image	
ENHANCE	Enhance correction of live image	
GAMMA	Gamma correction of live image	
CHROMA	Chroma adjustment of live image	
KNEE	Knee adjustment of live image	
DEPTH	Recorded bit length setting	
ZOOM	Zoom live image	
SCROOL	Scroll live image	

3.2 Recording Settings

Record Settings are described below are shown on Table 3-2 and Table 3-3.

3.2.1 Trigger Timing Selection (TRIGGER)

While in VIEW mode, the Trigger Timing Selection can be set in the <VIEW MENU> or by using the TRIG Direct Key on the JPAD 3.

The Trigger Timing Selection sets the number of frames from the beginning of the recording to the Trigger input frame and to the end of the recording.

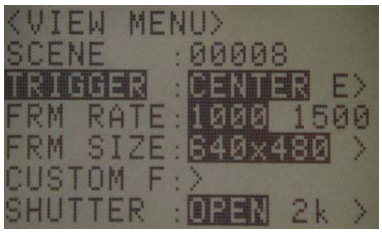


図 3-4 <VEW MENU> TRIGGER

■ <VIEW MENU> Setting

1) While in VIEW mode, press MENU to display the <VIEW MENU>
2) Select "TRIGGER:" using the arrows (Figure 3-4)
3) Use the arrows to select the Trigger Timing Selection

START	Start Trigger
CENTER	Center Trigger
END	End Trigger
+000%	Custom Trigger

Custom Trigger Setting

- i) Press the SET after selecting CUSTOM to edit the Custom Trigger setting
- ii) Use the LEFT/RIGHT arrows to move the cursor
  Use the UP/DOWN arrows to change the value (-100~+100)
- iii) Press SET again to exit Custom Trigger edit mode

■ TRIG Direct Key TRIG

While in view mode use the TRIG Direct Key to select one of the preset trigger settings. The TRIG Direct Key cannot be used to select CUSTOM Trigger settings.

3.2.1.1 Start Trigger

When START Trigger is selected 95% of the available recording time is allocated after the trigger frame. As a default 5% of the available recording time is allocated at before the trigger frame (Figure 3-5).

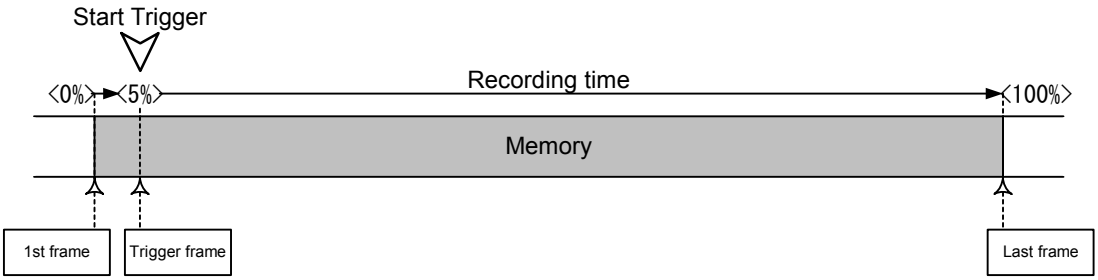


Figure 3-5 Recording with the Start Trigger

3.2.1.2 Center Trigger

When CENTER Trigger is selected the same number of frames (50/50) is allocated before and after the trigger frame (Figure 3-6).

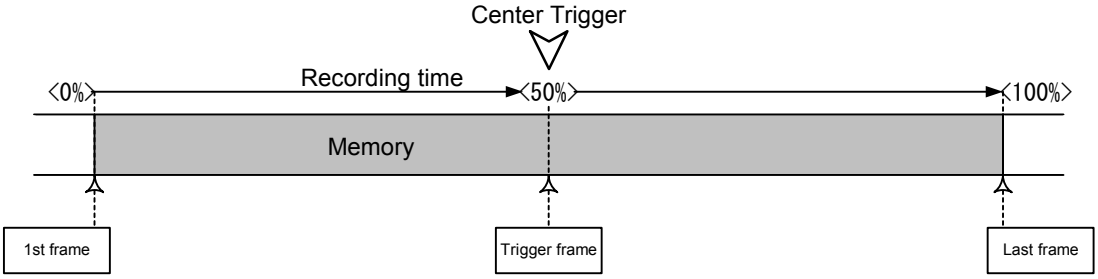


Figure 3-6 Recording with the Center Trigger

3.2.1.3 End Trigger

When END Trigger is selected 95% of the available recording time is allocated before the trigger frame. As a default 5% of the available recording time is allocated after the trigger frame (Figure 3-7).

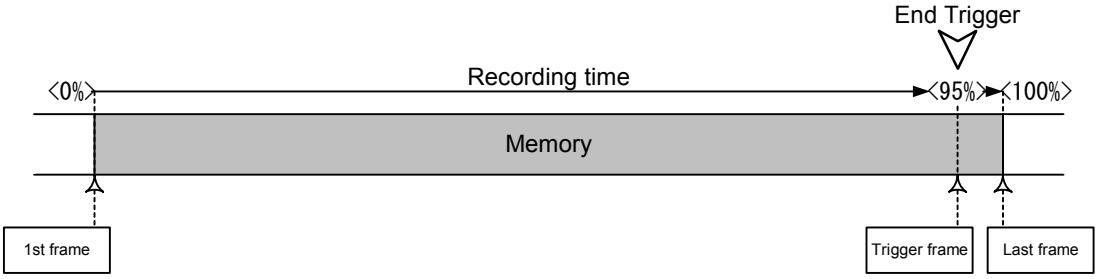


Figure 3-7 Recording with the End Trigger

3.2.1.4 Custom Trigger

In CUSTOM TRIGGER a positive percentage value corresponds to the percentage of available recording time from the beginning of the recording to the trigger frame. The percentage value can be set in 1% intervals. Figure 3-8 shows the Trigger Timing set at +25%.

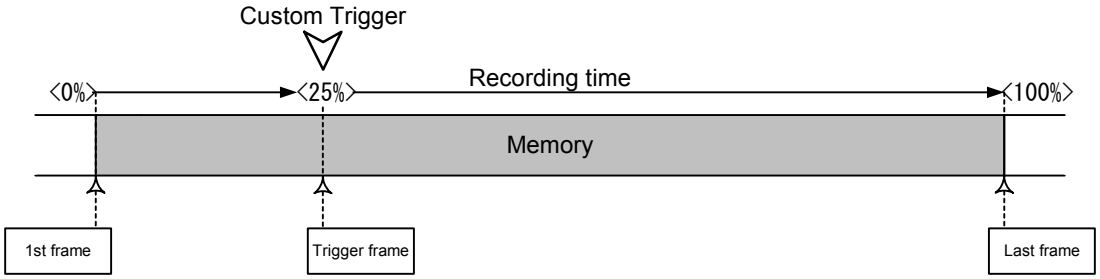


Figure 3-8 Recording with the Custom Trigger（+25%）

In CUSTOM TRIGGER a negative percentage value corresponds to a delay before the recording starts. The percentage value can be set in 1% intervals. Figure 3-9 shows the Trigger Timing set at -100% where the delay corresponds to the same amount of time as the record time. For example if there is 1 second of record time available, the recording will start after 1 second delay has passed.

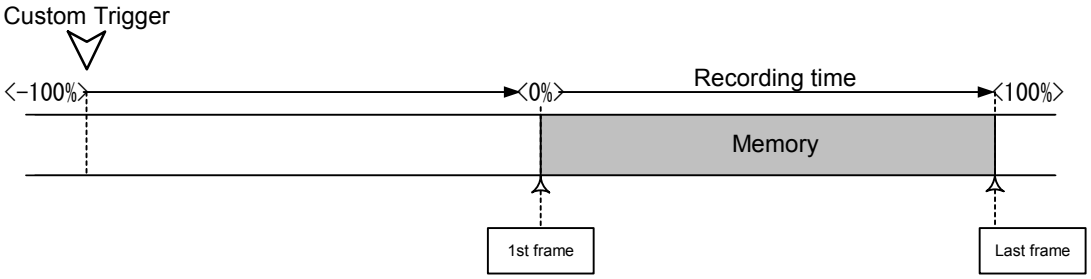


Figure3-9 Recording with the Custom Trigger（-100%）

3.2.2 Recording Speed Selection (FRM RATE)

While in VIEW mode, the Recording Speed Selection can be set in the <VIEW MENU> or by using the TRIG Direct Key on the JPAD 3. When multiple cameras are connected the Recording Speed setting applies to all cameras. Different Recording Speeds cannot be set for each camera independently.

■ <VIEW MENU> Setting

1) While in VIEW mode, press MENU to display the <VIEW MENU>
2) Select "FRM RATE:" using the arrows (Figure 3-10)
3) Use the arrows to select the Recording Speed

Refer to **【7.2.3 Recording Times】** for resolution and recording time that can be set for each recording speed.

50	50 pps (picture per second)
60	60 pps
100	100 pps
250	250 pps
500	500 pps
750	750 pps
1000	1,000 pps
1500	1,500 pps
2000	2,000 pps
2500	2,500 pps
3000	3,000 pps
4000	4,000 pps
5000	5,000 pps
6000	6,000 pps
8000	8,000 pps
10000	10,000 pps
15000	15,000 pps
20000	20,000 pps
25000	25,000 pps
30000	30,000 pps
40000	40,000 pps
50000	50,000 pps
60000	60,000 pps
80000	80,000 pps
100000	100,000 pps

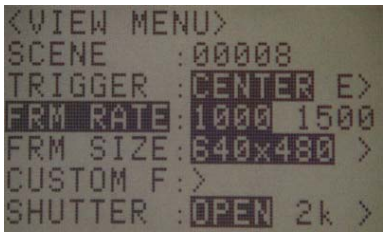


図 3-10 FRM RATE

■ FRM RATE Direct Key

While in view mode use the FRM RATE Direct Key to select one of the preset recording speeds. The TRIG Direct Key cannot be used to select CUSTOM Trigger settings.

3.2.3 Frame Size Selection (FRM SIZE)

While in VIEW mode, the Frame Size can be set in the <VIEW MENU> on the JPAD3. When multiple cameras are connected the Frame Size setting applies to all cameras. Different Frame Sizes cannot be set for each camera independently.

■ <VIEW MENU> Setting

1) While in VIEW mode, press MENU to display the <VIEW MENU>
2) Select "FRM SIZE:" using the arrows (Figure 3-11)
3) Use the arrows to select the frame size

The selected Recording Speed limits the Frame Sizes available. Refer to【**7.2.3 Recording Times**】for the frame sizes and recording times that can be set for each recording speed.

	Horizontal pixels (H)	**Vertical pixels (V)**
640 x 480	640(H)	x 480(V) pixel
576 x 432	576(H)	x 432(V) pixel
512 x 384	512(H)	x 384(V) pixel
384 x 288	384(H)	x 288(V) pixel
320 x 240	320(H)	x 240(V) pixel
256 x 192	256(H)	x 192(V) pixel
192 x 144	192(H)	x 144(V) pixel
128 x 96	128(H)	x 96(V) pixel
64 x 48	64(H)	x 48(V) pixel
32 x 16	32(H)	x 16 (V) pixel

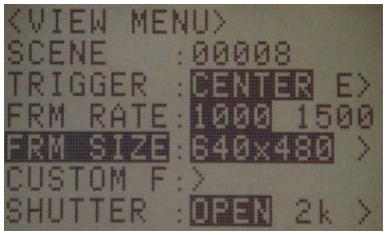


Figure 3-11 FRM SIZE

3.2.4 Custom Settings for Recording Speed and Frame Size (CUSTOM F)

While in VIEW mode, the recording speed and frame size can be selected from the <VIEW MENU> on the JPAD3.

- **Custom Settings for Recording Speed**
  The recording speed can be set at 1pps intervals. With frame size priority, the upper limit of the recording speed is determined by the frame size.

- **Custom Settings for Frame Size**
  Horizontal pixels can be set in 4 pixel intervals while vertical pixels can be set in 16 pixel intervals. With recording speed priority, the upper limit of the frame size is determined by the recording speed

■ <VIEW MENU> Setting

1) While in VIEW mode, press MENU to display the <VIEW MENU>
2) Select "CUSTOM F:" using the arrows and press SET to display the CUSTOM F sub-menu (Figure 3-12)

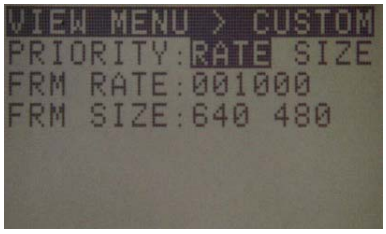


Figure 3-12 CUSTOM F

3) Select "PRIORITY:" using the arrows and then use the arrows to select either the Recording Speed or Frame Size as priority (Figure 3-13)

   RATE = Recording speed priority
   SIZE = Frame size priority

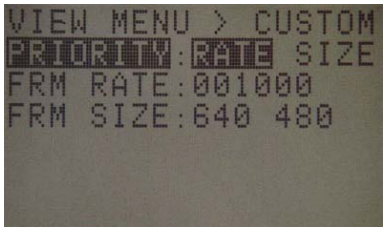


Figure 3-13 PRIORITY

■ <FRM RATE> Setting

4) Select "FRM RATE" for recording speed custom settings.

   - i) Select "FRM RATE" and press SET (Figure 3-14).
   - ii) Use the arrows to move the cursor and use the arrows to change the numerical value
   - iii) To set the recording speed press SET

   With frame size priority, to set a value larger than the upper limit for the recording speed, press SET to display the value for the upper limit.

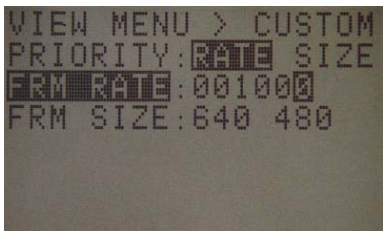


Figure 3-14 FRM RATE

■ <FRM SIZE> Setting

5) Select "FRM SIZE" for the frame size custom settings.

   - i) Select "FRM SIZE" and press SET (Figure 3-15).
   - ii) Use the arrows to change the number of horizontal pixels and the arrows to change the number of vertical pixels.
   - iii) To set the Frame Size press SET

   With recording speed priority, to set a value larger than the upper limit for the frame size, press SET to display the value of the upper limit.

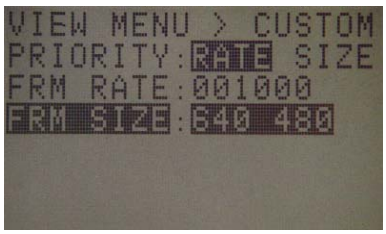


Figure 3-15 FRM SIZE

3.2.5 Shutter Exposure Time Selection (SHUTTER)

While in VIEW mode, the Shutter Exposure Time can be selected from the <VIEW MENU> on the JPAD3. The shutter exposure time can be selected from either preset or custom values.

■ <VIEW MENU> Setting

1) While in VIEW mode, press MENU to display the <VIEW MENU>
2) Select "SHUTTER:" using the arrows (Figure 3-16).

■ Preset Shutter Exposure Time

3) Use the arrows to select the desired preset shutter exposure time.

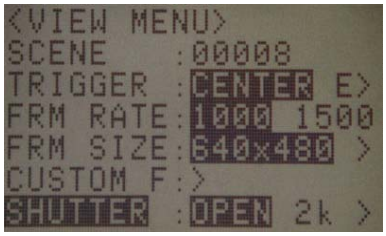


Figure 3-16 SHUTTER

OPEN	1/ recording speed sec
2 k	1/ 2000 sec
5 k	1/ 5000 sec
10 k	1/ 10,000 sec
20 k	1/ 20,000 sec
50 k	1/ 50,000 sec
100 k	1/ 100,000 sec
200 k	1/ 200,000 sec
333 k	1/ 333,333 sec

The upper limit for the shutter exposure time is set according to the recording speed. To set a value greater than the shutter exposure time, press SET to display the value of the upper limit.

■ Custom Shutter Exposure Time

The Custom Shutter Exposure Time can be set in the last preset value to the left which shows 6 numerical columns in microseconds (******us)

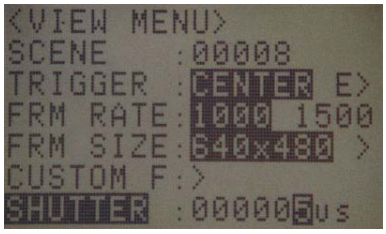


Figure 3-17 SHUTTER (Custom)

- i) Use the arrows to select (******us) and press SET.
- ii) Use the arrows to move the cursor and use the arrows to change the numerical value (Figure 3-17)
- iii) To set the Custom Shutter Exposure Time press SET

The available settings for the custom shutter exposure time change according to the recording speed and frame size.

■ SHUTTER Direct Key SHUTTER

While in STOP or VIEW modes use the SHUTTER Direct Key to select one of the preset recording speeds. The SHUTTER Direct Key cannot be used to select CUSTOM Trigger settings.

Important

When multiple MEMRECAM DRPs are connected ensure that all have a compatible Exposure Timing setting. The MEMRECAM GX series use START Exposure Timing. In contrast, the MEMRECAM fx series use END Exposure Timing.
Please refer to **【7.1.7 Compatibility with the conventional series】** for additional details on synchronizing mixed multi camera configurations.
Additional details for setting the Exposure Timing Selection (EXP TIME) can be found at **【3.2.17 Exposure Timing Selection (EXP TIME) 】**

3.2.6 Recording Bit Length Settings (DEPTH)

While in VIEW mode, the recording bit length can be set from the <VIEW MENU> on the JPAD3.

It is possible to alter the number of bits per pixel for the recorded image. With a high bit rate, the gradation of the image (the amount of change in brightness) of the image is finer and results in better image quality. With a low bit rate, the gradation of the image is rougher and it is possible to economize on the recording memory, and extend the recording time.

■ <VIEW MENU> Setting

1) While in VIEW mode, press MENU to display the <VIEW MENU>
2) Select "DEPTH:" using the arrows (Figure 3-18)
3) Use the arrows to select the recording bit length

8	8 bit
10	10 bit (standard image setting)

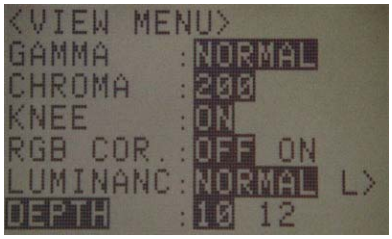


Figure 3-18 DEPTH

Important

Only 8 & 10 bits can be selected in the MEMRECAM GX-5. Althought the JPAD3 shows 12 bits is shown it cannot be selected.

3.2.73.2.10 Initial Value Settings for the Recorded Scene Number (SCENE)

While in VIEW mode, the initial value for the Recorded Scene Number (SCENE) can be set in the <VIEW MENU> on the JPAD3.

The initial value for the recorded scene can be set from 0～65535. The recorded scene number adds +1 each time recording is completed.

■ <VIEW MENU> Setting

1) While in VIEW mode, press MENU to display the <VIEW MENU>
2) Select "SCENE:" using the arrows and press SET. （Figure 3-19）.
3) Use the arrows to move cursor and then use the arrows to change the numerical value (0～65535)
4) Press SET again to set the initial value for the recorded scene number.

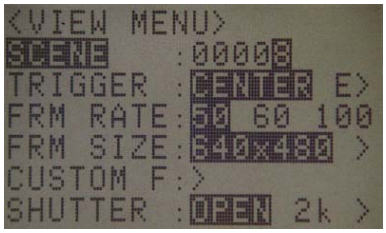


Figure 3-19 SCENE

3.2.8 Memory Segment Settings (SEG SIZE)

While in STOP mode, the number Memory Segments can be defined from the SYS MENU on the JPAD3.

The memory can be segmented into a maximum of 64 segments. The record time for the memory segments shortens as to the number of segments increase. Separate scenes can be recorded in each of the segments. Also, the recorded images for multiple scenes can be retained and downloaded together afterwards. The photographic conditions for each memory segment can be changed for recording.

Important

Images recorded in the memory are erased when the memory segments are chaged. Change the Memory Segment configuration only after confirming if it is an image that can be erased.
Save the image in memory to an USB storage media or to a PC using GXLink before continuing.
Please refer to 【2.10 Saving 】 or 【 GXLink manual 】 for the saving method of an image.

■ <VIEW MENU> Setting

1) While in STOP mode, press MENU to display the <TOP MENU>
2) Select "SYS MENU:" using the arrows and press SET to display the SYS MENU sub-menu
3) Select "SYS SET" using the arrows and press SET to display the SYS SET sub-menu (Figure 3-20)
4) Select "SEG SIZE" using the arrows and select the number of memory segments using the arrows

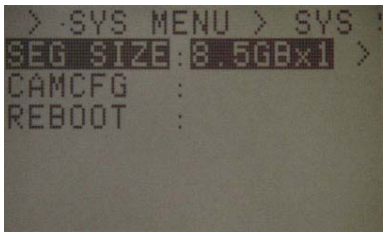


図 3-20 SYS SET

<MEMORY 8GB>

8.5GBX1	No memory segmentation
4.2GBX2	Segment into two 4.2GB segments
2.1GBX4	Segment into four 2.1GB segments
1.0GBX8	Segment into eight 1.0GB segments
533MBX16	Segment into sixteen 533MB segments
266MBX32	Segment into thirty two 266MB segments
133MBX64	Segment into sixty four 133MB segments

<MEMORY 4GB>

4.2GBX1	No memory segmentation
2.1GBX2	Segment into two 2.1GB segments
1.0GBX4	Segment into four 1.0GB segments
533MBX8	Segment into eight 533MB segments
266MBX16	Segment into sixteen 266MB segments
133MBX32	Segment into thirty two 133MB segments

5) Once the number of memory segments is selected, a verification message verifying the memory segmentation will be displayed (Figure 3-21).

Important

If there are no problems erasing the images saved in the memory press SET to segment the memory.

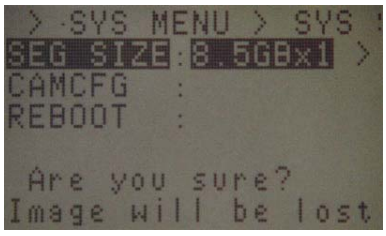


Figure 3-21 Verification message

3.2.9 External Trigger Signal Selection (TRIG SEL)

While in STOP mode, the external trigger signals can be selected from the <SYS MENU> on the JPAD3. The GX5 can be triggered manually using the JPAD3 remote control or from signal inputs on the J1 Cable TRIG1 branch and the J3 Cable TRIG2 branch.

■ <VIEW MENU> Setting

1) While in STOP mode, press MENU to display the <TOP MENU>
2) Select "SYS MENU:" using the arrows and press SET to display the SYS MENU sub-menu
3) Select "TRIG SET" using the arrows and press SET to display the TRIG SET sub-menu (Figure 3-22）.
4) Select "TRIG SEL" and use the arrows to select the external trigger signal input connector.

TRIG1 Trigger signal from TRIG1 connector (TTL Falling)
TRIG2 Trigger signal from TRIG2 connector (Rising)

Important External trigger signals from the J1 Cable TRIG1 connector and J3 Cable TRIG2 connector cannot be used simultaneously.

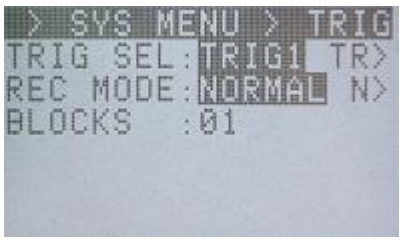


図 3-22 TRIG SET

The polarity of the external trigger signals from the TRIG1 and TRIG2 connectors can be set. Refer to **【3.2.13 Selecting Polarity for External Input/Output Signals】**.

3.2.9.1 External Trigger Signals from TRIG1

The TRIG1 connector can accept TTL or contact contact closure External trigger signals. Refer to **【7 Specifications】** for details.
The advantage for using trigger signals from TRIG1 is its ease of use. The camera is triggered when using the contact closure input when there is a connection between the two wires or switch. It is recommended that this trigger method be used in a clean environment where there is no external noise. The voltage tolerance range is quite narrow （-0.5～5.5Vdc）.

3.2.9.2 External Trigger Signals from TRIG2

The TRIG2 connector can accept voltage pulse External trigger signals via the current loop input from the photo coupler. Refer to **【7 Specifications】** for details.
The advantage for using trigger signals from TRIG2 is the excellent resistance to noise and is well suited for applications with long distance cables. This is the recommended method to use where there might be environment noise, such as where static is often generated. However, an external power source is needed to use this input.

3.2.9.3 Setting of filter value

A Noise Filter value can be set when noise is present in the external trigger signal. Please refer to 【3.2.14 trigger filter setting 】 for additional details.

3.2.10 Recording Method Selection (REC MODE)

While in STOP mode, the Recording Method can be selected from the <SYS MENU> on the JPAD3.

There are four recording methods available:

- **Normal Recording** **[NORMAL / NORMAL(A) / NORMAL(L)]**
- **Burst Recording** **[BURST / BURST(A) / BURST(L)]**
- **Multi Trigger Recording** **[MULTI(A) / MULTI(C) / MULTIS(A) / MULTIS(L)]**
- **Event Recording** **[EVENT / EVENT(A) / EVENT(L)]**

Important Depending on the recording method, there may be cases when the trigger input from the JPAD3 does not function. Trigger input from external trigger signals work on all recording methods (Table 3-4).

Table 3-4 Valid Trigger Input by Recording Method

Recording Method	Trigger Input	
	JPAD3 operation	External Trigger Signals
Normal Recording	○	○
Burst Recording	×	○
Multi Trigger Recording	○	○
Event Recording	△	○

× : Trigger input from the JPAD3 does not work with burst recording.
△ : With event recording, the initial trigger input does not work from the JPAD3 and the external trigger input only works with the second and subsequent event trigger input.

3.2.10.1 AUTO Mode

The AUTO mode automatically switches between memory segments when recording (REC mode) ends returning to ARM mode on the next segment. This allows for continuous recording for each memory segment. The DRP returns to STOP mode once recording of all of memory segments has been completed. The image in memory is protected once the recording has been completed thus overwritting is prohibited in AUTO mode. When attempting to switch to ARM mode, a warning message will be displayed (Figure 3-23).

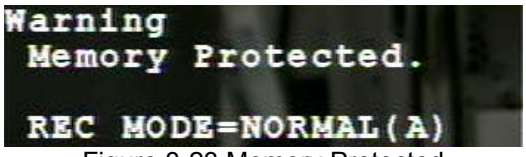


Figure 3-23 Memory Protected

Press STOP to stop recording even if recording to all of the memory segments has not been completed. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed.

3.2.10.2 LOOP Mode

While in LOOP mode the memory segments are automatically switched when recording (REC mode). Once the recording ends for the particular memory segment the camera returns to ARM mode on the next segment. It is different from AUTO mode since there is no memory protection upon the completion of recording. Images are overwritten allowing for repeated recording can be performed.

Recording is repeated until STOP is pressed.

Important It takes about 4.5 seconds each time there is a switch between memory segments. Ensure that the trigger input is received while in ARM mode since triggers signals may be ignored during this time.

3.2.10.3 Setting Record Modes

1) While in STOP mode, press MENU to display the TOP MENU.
2) Select "TRIG SET" from TOP MENU using the arrows and press SET to display the TRIG SET sub-menu (Figure3-24).
3) Select "REC MODE" and use the arrows to select the recording method.

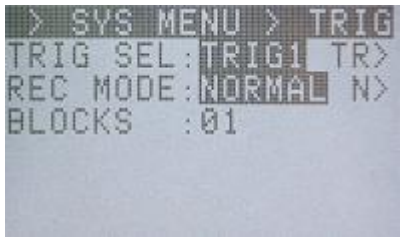


Figure 3-24 TRIG SET

NORMAL	Normal recording
NORMAL (A)	Normal recording in AUTO mode
NORMAL (L)	Normal recording in LOOP mode
EVENT	Event recording
EVENT (A)	Event recording in AUTO mode
EVENT (L)	Event recording in LOOP mode
BURST	Burst recording
BURST (A)	Burst recording in AUTO mode
BURST (L)	Burst recording in LOOP mode
MULTI (A)	Multi trigger recording in ALL BLOCKS mode
MULTI (C)	Multi trigger recording in CONTINUOUS mode
MULTIS (A)	Multi trigger recording in AUTO mode
MULTIS (L)	Multi trigger recording in LOOP mode

4) When selecting multi trigger recording, select "BLOCKS" to set the number of memory block segments.

- i) Select "BLOCKS" and press SET.
- ii) Use arrows to move columns and use arrows to change the numerical value (1～16).
- iii) Press SET again to set the number of blocks for multi trigger recording.

3.2.10.4 Normal Recording

Normal recording saves images to the appropriate memory segment for a single trigger input. The three modes within normal recording include NORMAL, NORMAL (A) and NORMAL (L). Refer to **【3.2.10.3 Setting Record Modes】** for the method of setting normal recording.

3.2.10.4.1 NORMAL

Figure 3-25 shows how to set for NORMAL recording (top of the figure) with the JPAD3 during and saving in the memory (bottom of the figure).

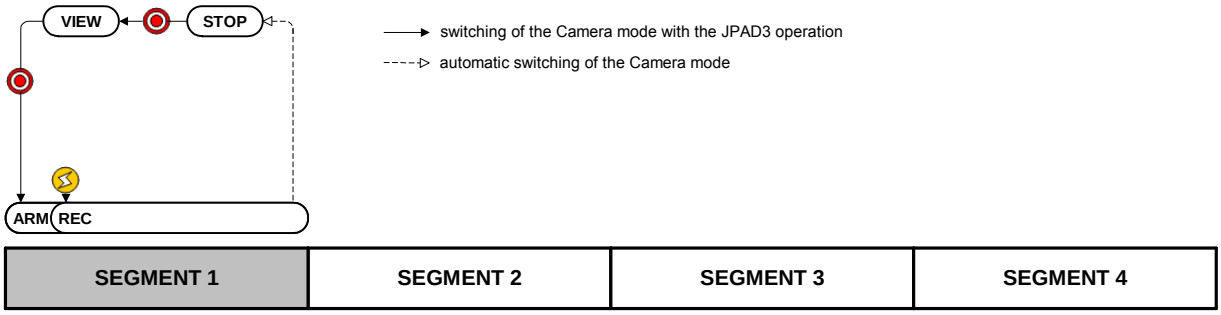


Figure 3-25 Normal Recording (NORMAL, number of segments：4)

The procedure for segmenting the memory into four memory segments and performing normal recording for memory segment 1 is shown below.

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
4) While in ARM mode, press TRIG on the JPAD3 or use the external trigger for input to switch to REC mode. Recording will end according to the set trigger timing.
5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches from REC mode to STOP mode.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.

- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed.

3.2.10.4.2 NORMAL (A)

Figure 3-26 shows how to set for NORMAL (A) recording (top of the figure) with the JPAD3 during and saving in the memory (bottom of the figure). NORMAL (A) refers to normal recording in AUTO mode.

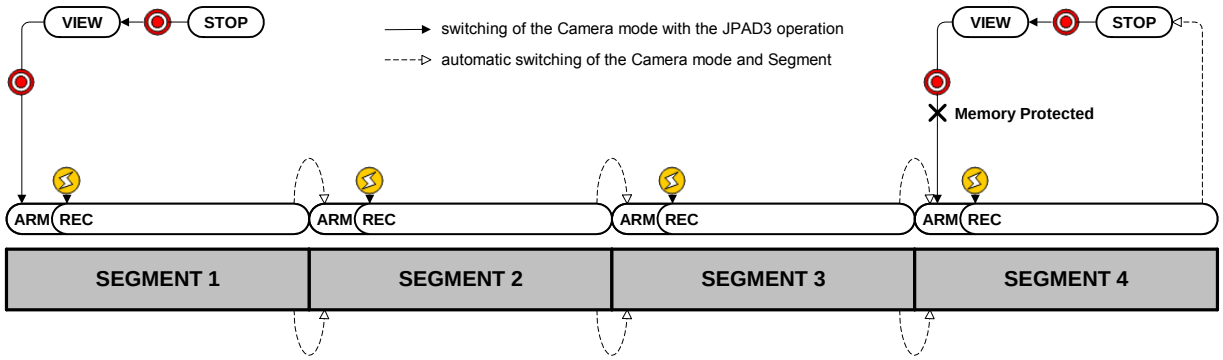


Figure 3-26 Normal Recording (NORMAL (A), Number of Segments：4)

The sequence for segmenting the memory into four memory segments and performing NORMAL (A) recording for memory segment 1 is shown below. The memory should be empty before recording is started.

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The memory segment number (SEG) superimposed on the image is displayed as "A". Settings in AUTO mode are displayed.

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
4) While in ARM mode, press TRIG on the JPAD3 or use the external trigger for input to switch to REC mode. Recording will end according to the set trigger timing.
5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from REC mode to ARM mode.
6) Recording in 4)～5) is repeated, and once recording to all of the memory segments has been completed, it switches from REC mode to STOP mode. It does not switch automatically after recording on the last memory segment (SEGMENT4).
7) Memory segments where recording has been completed are memory protected so will not switch to ARM mode. If you wish to start recording again, either change the setting to a recording method other than the AUTO mode, or erase a memory segment.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.

- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed.

3.2.10.4.3 NORMAL (L)

Figure 3-27 shows how to set for NORMAL (L) recording (top of the figure) with the JPAD3 during and saving in the memory (bottom of the figure).

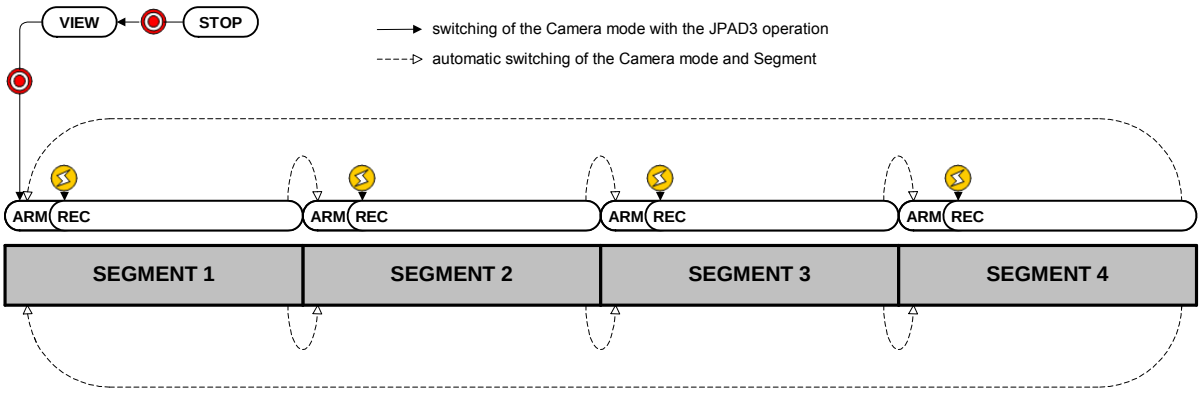


Figure 3-27　Normal Recording (NORMAL(L), Number of Segments：4)

The sequence for segmenting the memory into four memory segments and performing NORMAL(L) recording for all of the memory segments is shown below.

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The memory segment number (SEG) superimposed on the image is displayed as "L". Settings in LOOP mode are displayed.

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
4) While in ARM mode, press TRIG on the JPAD3 or use the external trigger for input to switch to REC mode. Recording will end according to the set trigger timing.
5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from REC mode to ARM mode.
6) Recording in 4)～5) is repeated, and once recording to all of the memory segments has been completed, it switches to the top memory segment (SEGMENT1) and it automatically switches from REC mode to ARM mode.

   The recording operation in 6) can be repeated while subsequent images are overwritten. Press STOP to stop recording.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.

- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed.

3.2.10.5 Burst Recording

While in Burst Recording mode, images are recorded as long as there is a burst trigger signal present. Burst trigger signals allow for only the desired frames within the time frame the signal is present to be saved to memory s shown in (Figure 3-28).
Also, the memory is automatically segmented into blocks according to the number of frames taken by each burst recording. Recording stops when the total of all the frames saved reached the maximum capacity of the memory. Figure 3-28 shows the number of frames for each recording time saved with three burst trigger signal inputs.

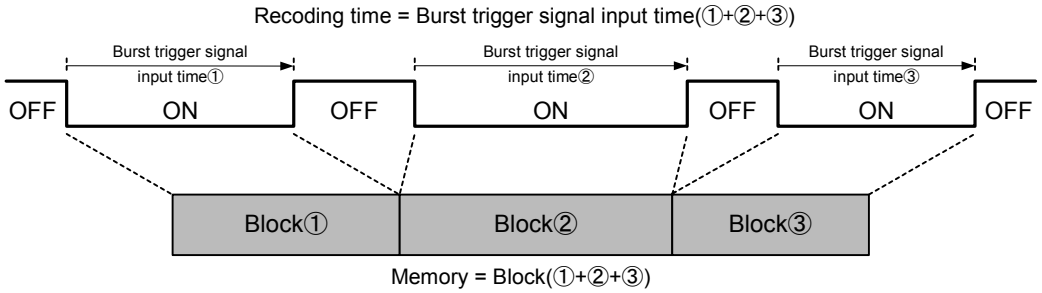


Figure 3-28　Burst Recording

The three modes within burst recording include BURST, BURST (A) and BURST (L). Refer to **【3.2.10.3 Setting Record Modes】** for the method of setting burst recording. Next are the restrictions on burst recording and the recording sequence for each mode.

3.2.10.5.1 Burst Recording Restrictions

The following restrictions apply to burst recording.

- Burst recording cannot be combined with multi trigger recording and event recording. Recording can be combined with EST synchronized signal recording.

- Trigger input does not work with the JPAD3 during burst recording. Input burst recording signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector.

- Burst recording signals can be input 16 times in the appropriate memory segment. If the time stamp is ON and the frame time standard is set to the exposure time, the restrictions on the number of burst recording signals is eliminated but during playback, it can jump to the top frame of each block up to 16 times.
  Please refer to the 【3.2.16 Time stamp recording settings】 for the time stamp settings and to 【5 System settings】 for the frame time standard settings.

3.2.10.5.2 BURST

Figure 3-29 shows how to set for BURST recording (top of the figure) with the JPAD3 during and saving in the memory (bottom of the figure). B1 and B2 refer to the blocks of segmented memory corresponding to the burst trigger signals.

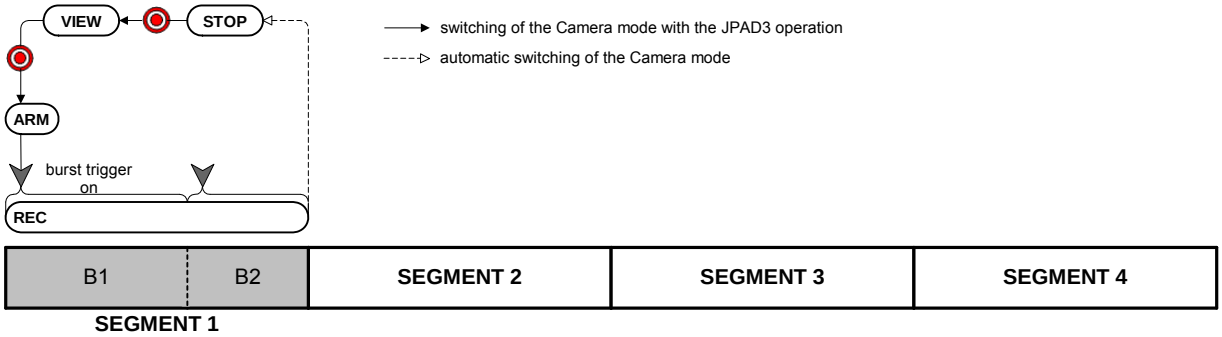


Figure 3-29 Burst Recording (BURST, number of segments：4)

The sequence for segmenting the memory into four memory segments and performing burst recording for memory segment 1 is shown below.

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The frame counter (FRAME) superimposed on the image is displayed as "B". Burst recording settings are displayed.

   "BURST" is displayed for trigger timing (Trigger).

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode.
   During burst recording, images cannot be overwritten, even in ARM mode. Also, live images cannot be updated.
4) While in ARM mode, input the burst trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to switch to REC mode.
   Images are saved only when the burst trigger signal is ON, and when live images are updated. Recording ends after the number of frames for the appropriate memory segment (SEGMENT1) are saved.
5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to STOP mode from REC mode.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  As much as one frame is not recorded in case of burst recording.

- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed.

3.2.10.5.3 BURST (A)

Figure 3-30 shows how to set for BURST (A) recording (top of the figure) with the JPAD3 during and saving in the memory (bottom of the figure). BURST (A) refers to burst recording during the AUTO recording. B1, B2, B3 and B4 refer to the blocks of segmented memory corresponding to the burst trigger signals.

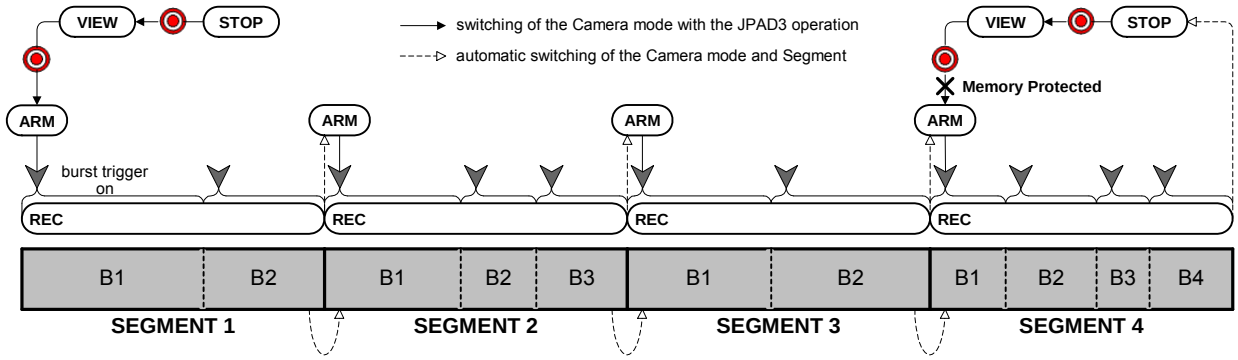


Figure 3-30 Burst Recording (BURST(A), Number of Segments：4)

The sequence for segmenting the memory into four memory segments and performing BURST (A) recording for all of the memory segments is shown below. The memory should be empty before recording is started.

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The memory segment number (SEG) superimposed on the image is displayed as "A". Settings in AUTO mode are displayed.

   "B" is shown in the frame counter (Frame). Burst recording settings are displayed.

   "BURST" is displayed for trigger timing (Trigger).

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode.
   During burst recording, images cannot be overwritten, even in ARM mode. Also, live images cannot be updated.
4) While in ARM mode, input the burst trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to switch to REC mode.
   Images are saved only when the burst trigger signal is ON, and when live images are updated. Recording ends after the number of frames for the appropriate memory segment (SEGMENT1) are saved.
5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from REC mode to ARM mode.
6) Recording in 4)～5) is repeated, and once recording to all of the memory segments has been completed, it switches from REC mode to STOP mode. It does not switch automatically after recording on the last memory segment (SEGMENT4).
7) Memory segments where recording has been completed are memory protected so will not switch to ARM mode. If you wish to start recording again, either change the setting to a recording method other than the AUTO mode, or erase a memory segment.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  As much as one frame is not recorded in case of burst recording.
- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed.

3.2.10.5.4 BURST (L)

Figure 3-31 shows how to set for BURST (L) recording (top of the figure) with the JPAD3 during and saving in the memory (bottom of the figure). BURST (L) refers to burst recording in LOOP mode. B1, B2, B3 and B4 refer to memory segmented blocks that correspond to the burst trigger signals.

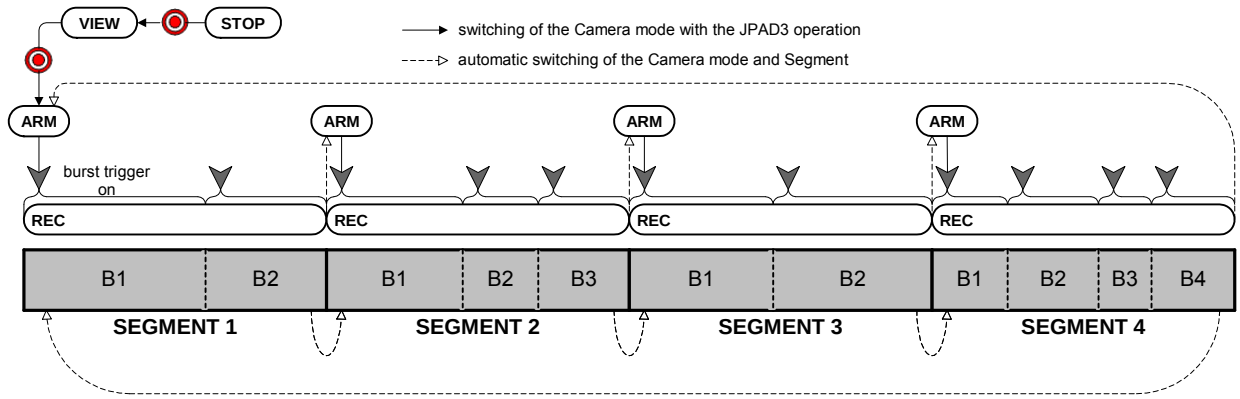


Figure3-31 Burst Recording (BURST (L), Number of Segments：4)

The sequence for segmenting the memory into four memory segments and performing BURST (L) recording for all of the memory segments is shown below.

1) Verify that the MEMRECAM GX-1 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The memory segment number (SEG) superimposed on the image is displayed as "L". Settings in LOOP mode are displayed.

   "B" is shown in the frame counter (Frame). Burst recording settings are displayed.

   "BURST" is displayed for trigger timing (Trigger).

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode. During burst recording, images cannot be overwritten, even in ARM mode. Also, live images cannot be updated.
4) While in ARM mode, input the burst trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to switch to REC mode.
   Images are saved only when the burst trigger signal is ON, and when live images are updated. Recording ends after the number of frames for the appropriate memory segment (SEGMENT1) are saved.
5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from REC mode to ARM mode.
6) Recording in 4)～5) is repeated, and once recording to all of the memory segments has been completed, it switches to the top memory segment (SEGMENT1) and automatically switches from REC mode to ARM mode.

   The recording operation in 6) can be repeated while subsequent images are overwritten. Press STOP to stop recording.

※ Press STOP to stop recording, even when recording to the appropriate memory segment has not been completed. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  As much as one frame is not recorded in case of burst recording.
- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed.

3.2.10.6 Multi Trigger Recording

When using multi trigger recording, the memory can be segmented into a maximum of 16 uniform blocks. Each block is then triggered and multiple images can be recorded separately. When the recording (REC Mode) for the block is completed it automatically switches between blocks returning to ARM mode ready to record the next block (ALL BLOCKS Mode).

The four modes within multi trigger recording include MULTI (A), MULTI (C), MULTIS (A), and MULTIS (L). Refer to **【3.2.10.3 Setting Record Modes】** for the multi trigger recording settings and the settings for the number of segmented blocks. Next are the restrictions on multi trigger recording and the recording sequence for each mode.

3.2.10.6.1 Multi Trigger Recording Restrictions

The following restrictions apply to multi trigger recording.

- Multi trigger recording cannot be combined with burst recording and event recording. Recording can be combined with EST synchronized signal recording.

- Automatic block switching takes about 2.5 seconds. Ensure that the trigger input is received while in ARM mode since triggers signals may be ignored during this time.

3.2.10.6.2 MULTI (A)

The (A) in MULTI (A) indicates that it is set to “ALL BLOCKS” mode. In the ALL BLOCKS mode, once recording to all of the blocks in the appropriate segment has been completed, it returns to STOP mode.
The ALL BLOCKS mode is a basic operation of multi trigger recording. MULTI (C), MULTIS (A) and MULTIS (L) recording can also be used.
Figure 3-32 shows how to switch modes with the JPAD3 during MULTI(A) recording (top of the figure) and saving in the memory (bottom of the figure).
The sequences for setting two memory segments and four blocks, and for MULTI(A) recording to memory segment 1 are shown below.

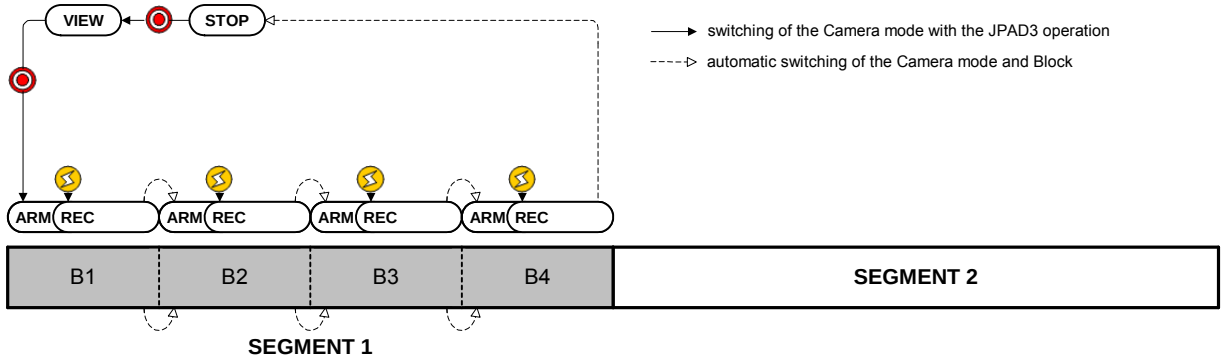


Figure 3-32 Multi Trigger Recording (MULTI (A), Number of Segments: 2, Number of Blocks: 4)

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The frame counter (FRAME) superimposed on the image shows "04 A". There are 4 blocks displaying the ALL BLOCKS mode setting.

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode.
   The frame counter (Frame) displays "01 A". While the images are overwritten to block 1, it awaits trigger input.

4) While in ARM mode, press TRIG on the JPAD3 or use the external trigger for input to switch to REC mode.
   Recording will end according to the set trigger timing.
5) Once recording to the appropriate block (B1) has been completed, it switches to the next block (B2) and automatically switches from REC mode to ARM mode.
6) Recording in 4)～5) is repeated, and once recording to all of the blocks in the appropriate memory segment (SEGMENT1) has been completed, it switches from REC mode to STOP mode.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed

3.2.10.6.3 MULTI(C)

MULTI (C) indicates “CONTINUOUS” mode. In CONTINUOUS mode, multi trigger recording can be repeated while overwriting blocks in the appropriate segment after the recording has been completed.
Figure 3-33 shows how to switch modes with the JPAD3 during MULTI (C) recording (top of the figure) and saving in the memory (bottom of the figure).
The sequences for setting two memory segments and four blocks, and for MULTI (A) recording to memory segment 1 are shown below.

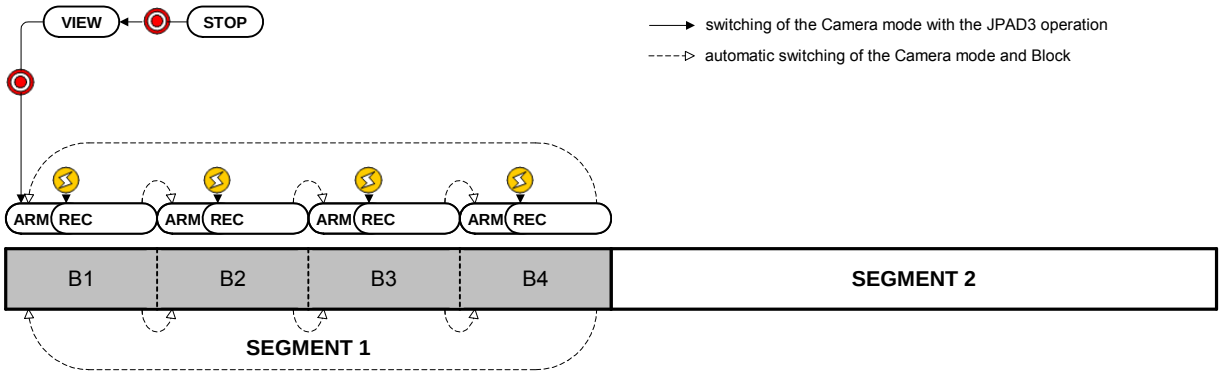


Figure 3-33 Multi Trigger Recording (MULTI(C), Number of Segments: 2, Number of Blocks: 4)

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The frame counter (FRAME) superimposed on the image shows "04 C". There are 4 blocks displaying the CONTINUOUS mode setting.

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode.
   The frame counter (Frame) displays "01 C". While the images are overwritten to block 1, it awaits trigger input.

4) While in ARM mode, press TRIG on the JPAD3 or use the external trigger for input to switch to REC mode.
   Recording will end according to the set trigger timing.
5) Once recording to the appropriate block (B1) has been completed, it switches to the next block (B2) and automatically switches from REC mode to ARM mode.
6) Recording in 4)～5) is repeated, and once recording to all of the blocks in the appropriate memory segment (SEGMENT1) has been completed, it switches to the top block (B1) and automatically switches from REC mode to ARM mode.

   The recording operation from 6) can be repeated while subsequent images are overwritten. Press STOP to stop recording.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed.

3.2.10.6.4 MULTIS(A)

Figure 3-34 shows how to switch modes with the JPAD3 during MULTIS (A) recording (top of the figure) and saving in the memory (bottom of the figure). MULTIS (A) is multi trigger recording in AUTO mode.
The sequences for setting two memory segments and four blocks, and for MULTIS (A) recording to all of the memory segments are shown below.
The memory should be empty before recording is started.

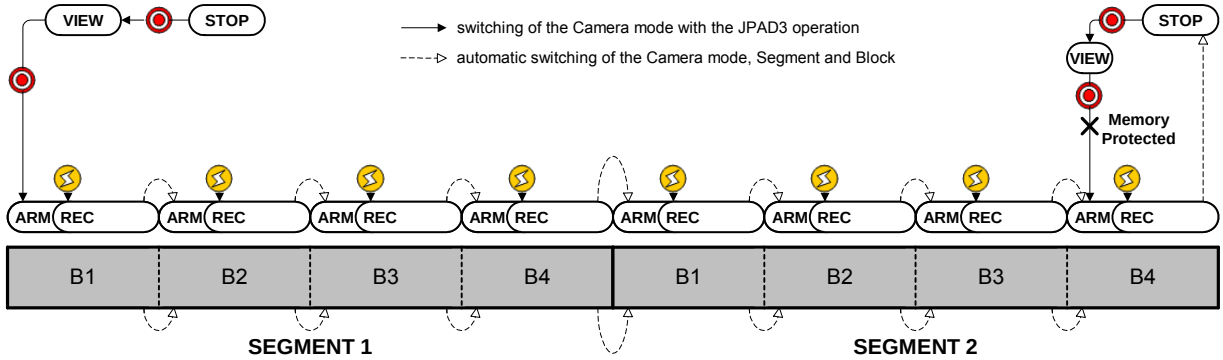


Figure3-34 Multi Trigger Recording (MULTIS (A), Number of Segments: 2, Number of Blocks: 4)

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The memory segment number (SEG) superimposed on the image shows "A". The AUTO mode settings are displayed.

   The frame counter (FRAME) superimposed on the image shows "04 A". There are 4 blocks displaying the ALL BLOCKS mode setting.

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode.
   The frame counter (Frame) displays "01 A". While the images are overwritten to block 1, it awaits trigger input.

4) While in ARM mode, press TRIG on the JPAD3 or use the external trigger for input to switch to REC mode.
   Recording will end according to the set trigger timing.
5) Once recording to the appropriate block (B1) has been completed, it switches to the next block (B2) and automatically switches from REC mode to ARM mode.
6) Repeat recording in 4)～5), and once recording to all of the blocks in the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from REC mode to ARM mode.
7) If the recording operation from 6) is repeated and recording to all of the memory segments has been completed, it switches from REC mode to STOP mode. The memory segment does not automatically switch after the final memory segment (SEGMENT2) recorded.
8) Memory protection applies to memory segments where the recording has been completed so it does not switch to ARM mode. If you want to record again, either change the settings to a recording method other than AUTO mode, or erase the memory segment.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed

3.2.10.6.5 MULTIS (L)

Figure 3-35 shows how to switch modes with the JPAD3 during MULTIS (L) recording (top of the figure) and saving in the memory (bottom of the figure). MULTIS (L) is multi trigger recording in the LOOP mode.
The sequences for setting two memory segments and four blocks, and for MULTIS (L) recording to all of the memory segments are shown below.

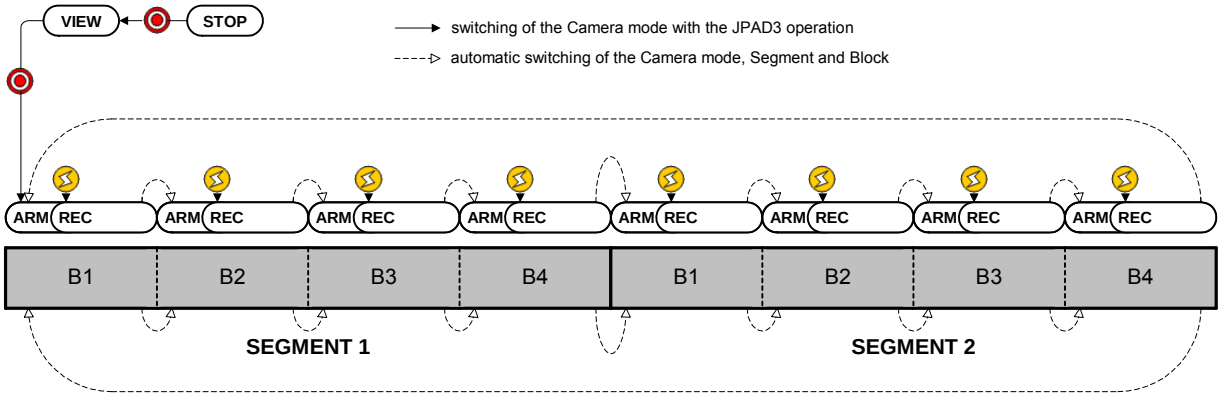


Figure3-35 Multi Trigger Recording (MULTIS (L), Number of Segments: 2, Number of Blocks: 4)

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The memory segment number (SEG) superimposed on the image shows "L". The LOOP mode settings are displayed.

   The frame counter (FRAME) superimposed on the image shows "04 A". There are 4 blocks displaying the ALL BLOCKS mode setting.

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode.
   The frame counter (Frame) displays "01 A". While the images are overwritten to block 1, it awaits trigger input.

4) While in ARM mode, press TRIG on the JPAD3 or use the external trigger for input to switch to REC mode.
   Recording will end according to the set trigger timing.
5) Once recording to the appropriate block (B1) has been completed, it switches to the next block (B2) and automatically switches from REC mode to ARM mode.
6) Repeat recording in 4)～5), and once recording to all of the blocks in the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from REC mode to ARM mode.
7) If the recording operation from 6) is repeated and recording to all of the memory segments has been completed, it switches to the top block (B1) of the top memory segment (SEGMENT1) and automatically switches from REC mode to STOP mode.

   The recording operation in 7) can be repeated while overwriting subsequent images. Press STOP to stop recording.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed

3.2.10.7 Event Recording

With event recording, the first trigger input is treated as a normal recording trigger signal and the second and subsequent trigger inputs are treated as event triggers. An identification mark, called an event frame, is marked onto the image the instant the event trigger occurs.
The three modes within event recording include EVENT, EVENT (A) and EVENT (L). Refer to **【3.2.10.3 Setting Record Modes】** for the method of setting event recording.

3.2.10.7.1 Event Recording Restrictions

The following restrictions apply to Event Recording.

- Event recording cannot be combined with burst recording and multi trigger recording. Recording can be combined with EST synchronized signal recording.
- The first trigger input can originate from the JPAD3 but continuous event trigger input are not possible with the JPAD3. The subsequent event trigger signals should originate from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector.
- The event is not recorded for custom trigger 100%～-1%.

3.2.10.7.2 EVENT

Figure 3-36 shows how to switch modes with the JPAD3 during event recording (top of the figure) and saving in the memory (bottom of the figure).
The sequence for segmenting the memory into four memory segments and performing event recording for memory segment 1 is shown below.

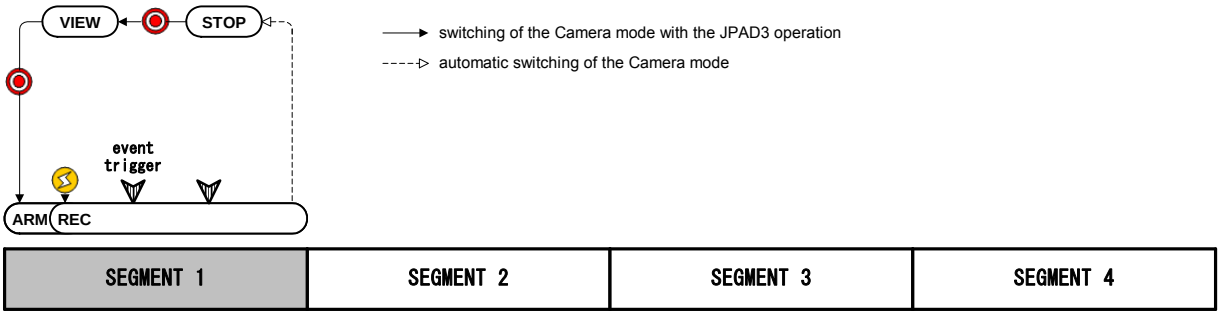


Figure 3-36 Event Recording (EVENT, number of segments : 4)

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The frame counter (FRAME) superimposed on the image is displayed as "E". Event recording settings are displayed.

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
4) While in ARM mode, press TRIG on the JPAD3 or use the external trigger for input to switch to REC mode. Continue to input event trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to save the event frames. Recording will end according to the set trigger timing.
5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches from REC mode to STOP mode.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed

3.2.10.7.3 EVENT (A)

Figure 3-37 shows how to switch modes with the JPAD3 during EVENT (A) recording (top of the figure) and saving in the memory (bottom of the figure). EVENT (A) refers to event recording in the AUTO mode.
The sequences for setting four memory segments and for EVENT (A) recording to all of the memory segments are shown below.The memory should be empty before recording is started.

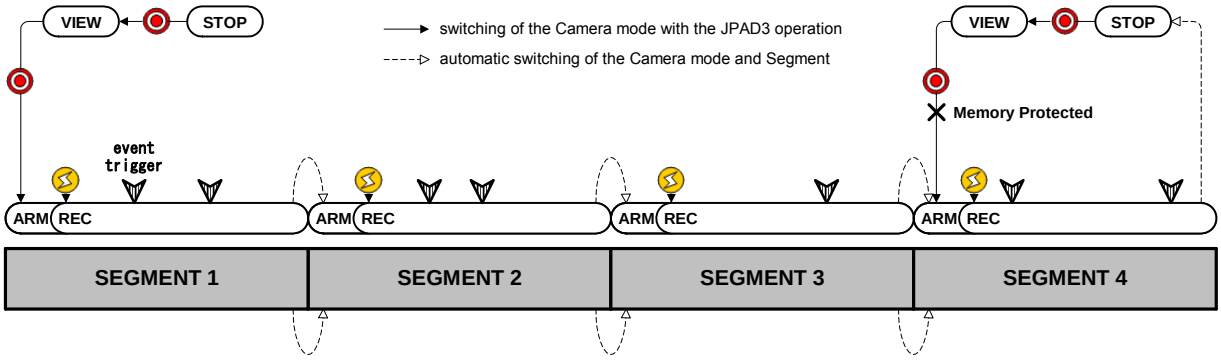


Figure 3-37 Event Recording (EVENT(A), Number of Segments: 4)

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The memory segment number (SEG) superimposed on the image shows "A". The AUTO mode settings are displayed.

   The frame counter (Frame) shows "E". The event recording settings are displayed.

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
4) While in ARM mode, press TRIG on the JPAD3 or use the external trigger for input to switch to REC mode. Continue to input event trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to save the event frames. Recording will end according to the set trigger timing.
5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from REC mode to ARM mode.
6) Repeat recording in 4)～5), and once recording to all of the memory segments has been completed, it switches from REC mode to STOP mode. The memory segment does not automatically switch after the final memory segment (SEGMENT4) recorded.
7) Memory protection applies to memory segments where the recording has been completed so it does not switch to ARM mode. If you want to record again, either change the settings to a recording method other than the AUTO mode, or erase the memory segment.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed.

3.2.10.7.4 EVENT (L)

Figure 3-38 shows how to switch modes with the JPAD3 during EVENT (L) recording (top of the figure) and saving in the memory (bottom of the figure). EVENT (L) is event recording in the LOOP mode.
The sequences for setting four memory segments and for EVENT (L) recording to all of the memory segments are shown below.

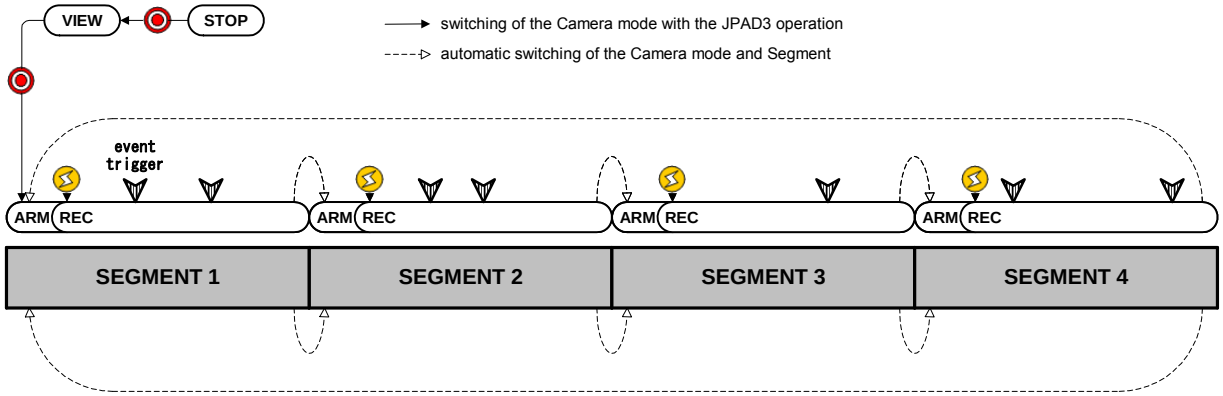
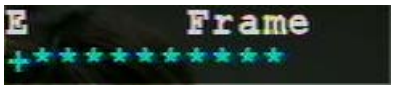


Figure 3-38 Event Recording (EVENT(L), Number of Segments: 4)

1) Verify that the MEMRECAM GX-5 is in STOP mode.
2) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
   The memory segment number (SEG) superimposed on the image shows "L". The LOOP mode settings are displayed.

   The frame counter (Frame) shows "E". The event recording settings are displayed.

3) While in VIEW mode, press VIEW/ARM on the JPAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
4) While in ARM mode, press TRIG on the JPAD3 or use the external trigger for input to switch to REC mode. Continue to input event trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to save the event frames. Recording will end according to the set trigger timing.
5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from REC mode to ARM mode.
6) Repeat recording in 4)～5), and once recording to all of the memory segments has been completed, it switches to the top memory segment (SEGMENT1) and automatically switches from REC mode to STOP mode.

   The recording operation in 6) can be repeated while subsequent images are overwritten. Press STOP to stop recording.

※ Press STOP even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP is pressed, the number of frames saved before recording is stopped will vary.

- If STOP is pressed during ARM mode
  If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP is pressed during REC mode
  Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed.

3.2.11 Synchronized Timing Selection (SYNC TIME)

While in STOP mode, the synchronized timing can be selected from the SYS MENU on the JPAD3.

The MEMRECAM GX-5 can be synchronized to an external timing device.

- Camera Synchronized Time
  Camera is synchronized with its internal timer. Select this option if the GX-5 is used stand alone or if there is no need for precise synchronization. If a control PC is connected, synchronization is possible with the PC.
- GX-HUB Synchronized Time
  Synchronized timing with the internal GX-HUB timer. Select if there are multiple camera connections using the GX-HUB. If a control PC is connected, synchronization with the PC time is possible.
- IRIG Synchronized Time
  Synchronized timing with the IRIG-B time code. Select from the following.
  - If the MEMRECAM GX-5 used alone and the IRIG-B time code is input from the J3 cable IRIG-B connector
  - If multiple cameras are connected using the GX-HUB and the IRIG-B time code is input to the GX-HUB
  - If multiple cameras are connected to the MEMRECAM GX-5 and another camera from the MEMRECAM series, and the GX-HUB is connected to the M-HUB, and the IRIG-B time code is input to the M-HUB

3.2.11.1 Setting Method

1) Select SYS MENU from the TOP MENU.
2) Select "SYNC TIME" from the SYS MENU (Figure 3-39).
3) Use the arrows to select the synchronized time.

ASYNC	Synchronized with the internal timer of the camera
GX-HUB	Synchronized with the internal timer of the GX-HUB
IRIG	Synchronized with the IRIG-B time code

Figure 3-39 SYNC TIME

Refer to the 【**GX-HUB User's Manual**】 for multiple connections using the GX-HUB.

3.2.11.2 IRIG Synchronized Time

Confirm whether or not the time is synchronized with the IRIG-B time code on VIEW screen.

1) While in STOP mode, press VIEW/ARM on the JPAD3 to switch to VIEW mode.
2) If "I" is displayed in green in the frame counter superimposed over the image, it is synchronized to the standard timing of the IRIG-B time code.

3) If "I" is displayed in red, the IRIG-B time code is not input properly.

3.2.12 Synchronized Signal Selection (SYNC SEL)

While in STOP mode, the synchronized signals can be selected from the SYS MENU on the JPAD3.

The MEMRECAM GX-5 uses the starting time for sensor exposure as the standard for recording. The exposure time is synchronized with the internal time signals or the external time signals shown below.

- Internal Time Signals（INT）
  Synchronized with the synchronized signals (VD signals) in the camera.
- External Time Signals（EST1,EST2）
  If EST1 or EST2 are selected, the exposure start signals (EST : External Shutter Trigger, Exposure Start) input from the J1 cable EST1 connector or the J3 cable EST2 connector are the standard. The minimum frequency for the EST signal is 0Hz so ultra high speed recording is possible.

3.2.12.1 Setting Method

1) While in STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU, and then press SET to display the SYS MENU.
3) Use the arrows to select "SYNC SEL" from the SYS MENU (Figure 3-40).
4) Use the arrows to select the synchronized signals.

Figure 3-40 SYNC SEL

INT	Synchronized with the internal synchronization signals of the camera
EST1	Synchronized with the EST1 signal from the J1 connector
EST2	Synchronized with the EST2 signal from the J3 connector

The EST1 signal and the EST2 signal are handled in an identical manner but cannot be used at the same time.

It is possible to set the polarity of the exposure start signal from the EST1 connector and the EST2 connector. Refer to **【3.2.13 External Input/Output Signal Polarity Selection】**.

3.2.12.2 Synchronized EST Signal Recording

3.2.12.2.1 Precautions for Use

1) Filter Value Settings
   If there is noise in the EST signal, set a noise filter value to activate the filter.
   Refer to the **【3. 2.14 EST Filter settings】** for the setting method.

2) Timing Restrictions
   The relationship between the cycle for the EST signal and the maximum recording speed must fulfill the following conditions. If they are not met, proper recording is not possible.

   EST signal cycle ＞ 1 ／ maximum recording speed

   The relationship between the cycle for the EST and the shutter exposure time must also fulfill the following conditions. If they are not met, proper recording is not possible.

   EST signal cycle ＞ shutter exposure time＋5.84μsec

3.2.12.2.2 Display During Recording

Operation can be verified during synchronized EST signal recording by the image and the rear panel LED display.

1) VIEW Mode
   Verify that "EST1" or "EST2" is displayed in the recording speed superimposed on the image and that the synchronized signal setting shows EST1 or EST2.

   While in VIEW mode, the rear panel CM LED flashes in white.

2) ARM Mode
   While in ARM mode, the rear panel CM LED flashes in magenta.

3) REC Mode
   While in REC mode, the rear panel CM LED flashes in orange.

3.2.13 External Input/Output Signal Polarity Selection (SIG SET)

While in STOP mode, the polarity of the external input/output signal can be selected from the SYS MENU on the JPAD3.

With the external input/output signals shown below, the polarity can be set to either a rising or a falling edge.

- External Trigger Input（TRIG1,TRIG2）
- External Synchronized Signal Input（EST1,EST2）
- Exposure Pulse Output（EPO）
- ARM Command Input（ARM CMD）
- ARM Status Output（ARM STS）
- FAULT Status Output（FAULT）

1) While in STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "SIG SET" from the SYS MENU and press SET to display the SIG SET sub-menu (Figure3-41).
4) Select the external input/output signal to be set and use the arrows to select the polarity.

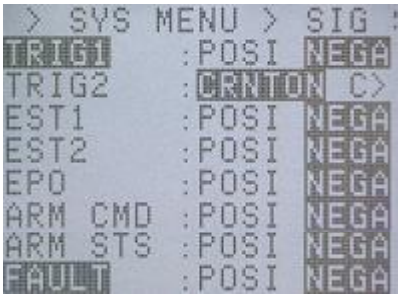


Figure 3-41 SIG SET

TRIG1	POSI	Search for the external trigger signal from the J1 cable by the rising edge
	NEGA	Search for the external trigger signal from the J1 cable by the falling edge
TRIG2	CRNTON	Search for the external trigger signal from the J3 cable by the rising edge
	CRNTOFF	Search for the external trigger signal from the J3 cable by the falling edge
EST1	POSI	Search for the EST signal from the J1 cable by the rising edge
	NEGA	Search for the EST signal from the J1 cable by the falling edge
EST2	POSI	Search for the EST signal from the J3 cable by the rising edge
	NEGA	Search for the EST signal from the J3 cable by the falling edge
EPO	POSI	Output the H level signal during exposure
	NEGA	Output the L level signal during exposure
ARM CMD	POSI	Detect ARM command signal by the rising edge
	NEGA	Detect ARM command signal by the falling edge
ARM STS	POSI	Output the H level signal during ARM mode
	NEGA	Output the L level signal during ARM mode
FAULT	POSI	Output the H level signal with fail status
	NEGA	Output the L level signal with fail status

3.2.14 Trigger Filter Settings (TRIGFLT)

While in STOP mode, the effect of the filter for the external trigger signal can be selected from the SYS MENU on the JPAD3.

The noise filter circuit of the digital method is built into MEMRECAM GX-5. The effect of the filter can be enlarged by significantly increasing the filter value when there are a lot of external noises.
The filter value shows delay time when a beautiful square pulse without chattering is input. It is possible to set it between 0.0～6553.5 μ sec in 0.1 μ sec.

This filter value is applied to two external trigger input (TRIG1, TRIG2) together.

However, when the polarity is set to NEGA, about 1.4μsec are always added to the delay time of TRIG1 (J1 cable) with an analog filter in the input part as for the delay. The added delay increases at about 30μsec when the polarity is set to POSI.
When the polarity is made CRNTON, about 150μsec are added to the delay time of TRIG2 (J3 cable) about 5μsec when making it to CRNTOFF.

1) While in STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "SIG SET" from the SYS MENU and press SET to display the SIG SET sub-menu.
4) 「TRIGFLT」 is selected, and press SET （Figure 3-42）.
5) Use the arrows to move columns and use arrows to change the numerical value.（Range：0.0～6553.5 μ sec）
6) Press SET again, and the filter value is set.

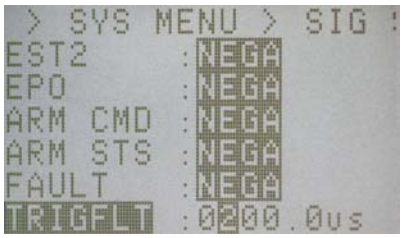


Figure 3-42 TRIGFLT

3.2.15 EST Filter Settings(EST FLT)

While in STOP mode, the effect of the filter for the EST signal can be selected from the SYS MENU on the JPAD3.

The noise filter circuit of the digital method is built into MEMRECAM GX-5. The effect of the filter can be enlarged by greatly setting the filter value when there are a lot of external noises.
The filter value shows delay time when a beautiful square pulse without chattering is input. It is possible to set it between 0.0～6553.5 μ sec in 0.1 μ sec.

This filter value is applied to two EST input (EST1,EST2) together.

However, when the polarity is set to NEGA, about 1.4μsec are always added to the delay time of EST1 (J1 cable) and EST2 (J3 cable) with an analog filter in the input part as for the delay. The added delay increases at about 30μsec when the polarity is set to POSI.

1) While in STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "SIG SET" from the SYS MENU and press SET to display the SIG SET sub-menu.
4) 「EST FLT」 is selected, and press SET （Figure 3-43）.
5) Use the arrows to move columns and use arrows to change the numerical value.（Range：0.0～6553.5 μ sec）
6) Press SET again, and the filter value is set.

Figure 3-43 EST FLT

3.2.16 Time Stamp Recording Settings(TIMSTAMP)

While in STOP mode, Time Stamp Recording can be selected from the SYS MENU on the JPAD3

The Time Stamp Recording is a function to record the following information at the same time when each frame is recorded.

- Trigger Time (unit of μsec at minute and second of date)
- Event, IRIG lock(flag bit identification)
- Exposure time（Date and time minute, second, msec, a μsec）

1) While in STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select " TIMSTAMP " from the SYS MENU (Figure 3-44).
4) Use the arrows to select Time Stamp.

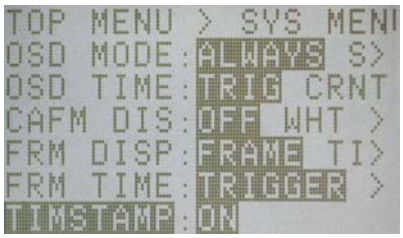


Figure 3-44 TIMSTAMP

OFF	The time stamp is not recorded.
ON	The time stamp is recorded.

(Attention) Time is not displayed like

and

, etc. When the setting of the time stamp is OFF, the frame counter display setting is "TIME" or "ABS.TIME", and it uses in the EST mode.

3.2.17 Exposure Timing Selection (EXP TIME)

While in STOP mode, the sensor exposure times for synchronized signal recording can be selected from the SYS MENU on the JPAD3.

The sensor exposure times for synchronized signal recording is different depending on the MEMRECAM GX-5 or other MEMRECAM series cameras (fx,ci cameras). When conducting synchronized recording with the MEMRECAM GX-5 and other MEMRECAM series cameras, the exposure times for all of the cameras must be coordinated.

1) While in STOP mode, press MENU (MENU) to display the TOP MENU.
2) Use the arrows (▲)(▼) to select "SYS MENU" from the TOP MENU and press SET (SET) to display the SYS MENU.
3) Use the arrows (▲)(▼) to select "EXP TIME" from the SYS MENU. (Figure3-45)
4) Use the arrows (◀)(▶) to select the exposure time.

Figure 3-45 EXP TIME

GXnative	Start exposure with rising synchronized signal recording (Setting only when recording in GX Series)
K3compat	End exposure with rising synchronized signal recording (Setting only with synchronized recording with fx series cameras other than fx-K4 and K5)
K4compat	End exposure with rising synchronized signal recording (Setting for synchronized recording with fx-K4 and K5)

(Attention) **【GXLink User's Manual】** for synchronized recording with multiple camera connections between MEMRECAM GX-5 and other MEMRECAM series cameras.

3.3 Live Image / Playback Image Settings

The image quality of the live images displayed during photographing and the playback images displayed after photographing can be adjusted. It is also possible to zoom the images and have scroll display.

3.3.1 Gain (GAIN)

Sets the image sensitivity.

3.3.1.1 Gain Settings for Live Images

1) While in VIEW mode, press MENU to display VIEW MENU.
2) Use the arrows to select "GAIN" from VIEW MENU. (Figure 3-46)
3) Use the arrows to select the gain.

LOW	One level lower than NORMAL sensitivity
NORMAL	Standard sensitivity setting
HIGH	One level higher than NORMAL sensitivity

Figure 3-46 GAIN(VIEW MENU)

3.3.1.2 Gain Settings for Playback Images

1) While in STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "GAIN" from the TOP MENU. （Figure 3-47）
3) Use the arrows to select the gain.

LOW	One level lower than NORMAL sensitivity
NORMAL	Standard sensitivity setting
HIGH	One level higher than NORMAL sensitivity

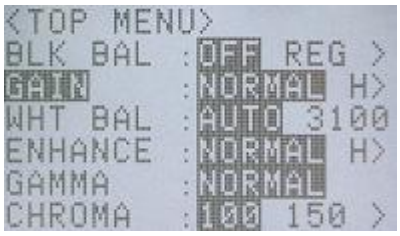


Figure 3-47 GAIN(TOP MENU)

3.3.2 Enhance (ENHANCE)

Sets the profile enhancement for the image.

3.3.2.1 Enhance Settings for Live Images

1) While in VIEW mode, press MENU (MENU) to display VIEW MENU.
2) Use the arrows (▲)(▼) to select "ENHANCE" from VIEW MENU. (Figure3-48)
3) Use the arrows (◀)(▶) to select the enhance.

OFF	No profile enhancement
LOW	Low profile enhancement
NORMAL	Normal profile enhancement
HIGH	High profile enhancement

Figure 3-48 ENHANCE(VIEW MENU)

3.3.2.2 Enhance Settings for Playback Images

1) While in STOP mode, press MENU (MENU) to display the TOP MENU.
2) Use the arrows (▲)(▼) to select "ENHANCE" from the TOP MENU. (Figure3-49)
3) Use the arrows (◀)(▶) to select the enhance.

OFF	No profile enhancement
LOW	Low profile enhancement
NORMAL	Normal profile enhancement
HIGH	High profile enhancement

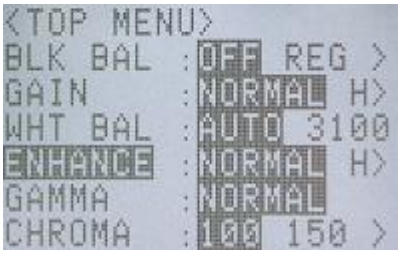


Figure 3-49 ENHANCE(TOP MENU)

3.3.3 Gamma (GAMMA)

Sets the gamma properties for the image.

3.3.3.1 Gamma Settings for Live Images

1) While in VIEW mode, press MENU (MENU) to display VIEW MENU.
2) Use the arrows (▲▼) to select "GAMMA" from VIEW MENU. (Figure3-50）
3) Use the arrows (◀▶) to select the gamma.

OFF	No gamma correction
LOW	Low gamma correction
NORMAL	Normal gamma correction

Figure 3-50 GAMMA(VIEW MENU)

3.3.3.2 Gamma Settings for Playback Images

1) While in STOP mode, press MENU (MENU) to display the TOP MENU.
2) Use the arrows (▲▼) to select "GAMMA" from the TOP MENU.（Figure3-51）
3) Use the arrows (◀▶) to select the gamma.

OFF	No gamma correction
LOW	Low gamma correction
NORMAL	Normal gamma correction

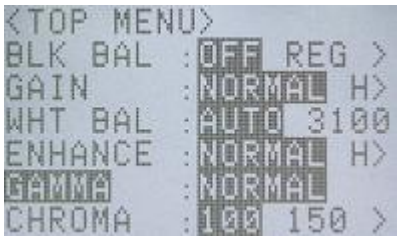


Figure 3-51 GAMMA(TOP MENU)

3.3.4 Chroma (CHROMA)

Sets the chroma (color density) of the image.

3.3.4.1 Chroma Settings for Live Images

1) While in VIEW mode, press MENU (MENU) to display VIEW MENU.
2) Use the arrows (▲)(▼) to select "CHROMA" from VIEW MENU. (Figure 3-52)
3) Use the arrows (◀)(▶) to select the chroma.

0	Chroma	0% (Black and white image)
50	Chroma	50%
100	Chroma	100% (normal)
150	Chroma	150%
200	Chroma	200%

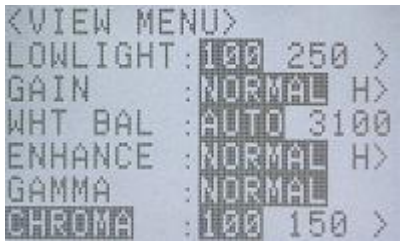


Figure 3-52 CHROMA(VIEW MENU)

3.3.4.2 Chroma Settings for Playback Images

1) While in STOP mode, press MENU (MENU) to display the TOP MENU.
2) Use the arrows (▲)(▼) to select "CHROMA" from the TOP MENU. (Figure3-53)
3) Use the arrows (◀)(▶) to select the chroma.

0	Chroma	0% (Black and white image)
50	Chroma	50%
100	Chroma	100% (normal)
150	Chroma	150%
200	Chroma	200%

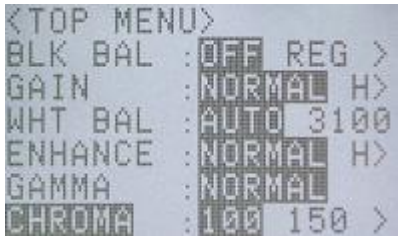


Figure 3-53 CHROMA(TOP MENU)

3.3.5 Knee (KNEE)

Reduces the gain and corrects the dynamic range for signals where the brightness exceeds a prescribed level.

3.3.5.1 Knee Settings for Live Images

1) While in VIEW mode, press MENU to display VIEW MENU.
2) Use the arrows to select "KNEE" from VIEW MENU. (Figure 3-54)
3) Use the arrows to select the knee.

OFF	Knee Correction OFF
ON	Knee Correction ON

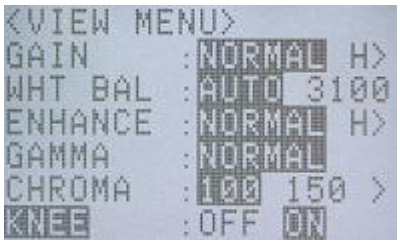


Figure 3-54 KNEE(VIEW MENU)

3.3.5.2 Knee Settings for Playback Images

1) While in STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "KNEE" from the TOP MENU. (Figure3-55)
3) Use the arrows to select the knee.

OFF	Knee Correction OFF
ON	Knee Correction ON

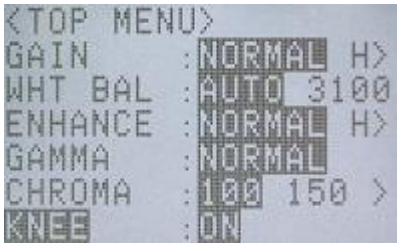


Figure 3-55 KNEE(TOP MENU)

3.3.6 RGB Matrix(RGB COR.)

RGB matrix that improves the color reproduction of the image can be corrected.

3.3.6.1 RGB Matrix Settings for Live Images

4) While in VIEW mode, press MENU to display VIEW MENU.
5) Use the arrows to select " RGB COR." from VIEW MENU. (Figure 3-56)
6) Use the arrows to select the RGB Matrix.

OFF	RGB Matrix Correction OFF
ON	RGB Matrix Correction ON

Figure 3-56 RGB COR.(VIEW MENU)

3.3.6.2 RGB Matrix Settings for Playback Images

4) While in STOP mode, press MENU to display the TOP MENU.
5) Use the arrows to select " RGB COR." from the TOP MENU. (Figure3-57)
6) Use the arrows to select the RGB Matrix.

OFF	RGB Matrix Correction OFF
ON	RGB Matrix Correction ON

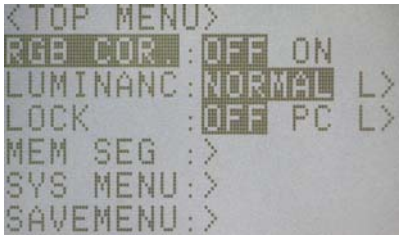


Figure 3-57 RGB COR.(TOP MENU)

3.3.7 Luminance (LUMINANC)

The I/O characteristic of the image data (brightness) can be set. When LINEAR is selected, a full-scale value of the input data of the image is converted into the value of 8 bits (0～255) linear.

3.3.7.1 Luminance Settings for Live Images

1) While in VIEW mode, press MENU (MENU) to display VIEW MENU.
2) Use the arrows (▲▼) to select " LUMINANC " from VIEW MENU. (Figure 3-58)
3) Use the arrows (◀▶) to select the I/O characteristic of brightness.

Figure 3-58 LUMINANC(VIEW MENU)

NORMAL	The gain, the gamma, and the knee correction are effective.
LINEAR	The image data is converted linear and displays it. (The gain, the gamma, and the Nee correction are invalid)

3.3.7.2 Luminance Settings for Playback Images

7) While in VIEW mode, press MENU (MENU) to display VIEW MENU.
8) Use the arrows (▲▼) to select " LUMINANC " from VIEW MENU. (Figure 3-59)
9) Use the arrows (◀▶) to select the I/O characteristic of brightness.

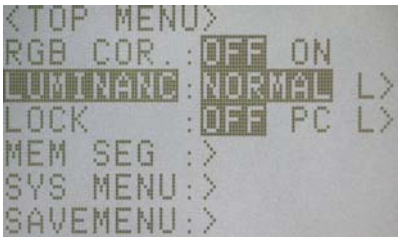


Figure 3-59 LUMINANC(TOP MENU)

NORMAL	The gain, the gamma, and the knee correction are effective.
LINEAR	The image data is converted linear and displays it. (The gain, the gamma, and the Nee correction are invalid)

3.3.8 Black Balance (BLK BAL)

Function that corrects the black level sensor and erases noise elements.

The MEMRECAM GX-5 reads the sensor temperature and automatically implements the black balance. However, if a finer image is desired, the black balance should be selected just prior to photographing.

The sensor black level and the noise elements will vary according to the recording speed and frame size settings. Also, if the recording speed and frame size are changed when the black balance is ON (REG), a black balance warning will be displayed.

Black balance can only be calculated while in STOP mode.

1) Put the lens cap on the camera so the sensor receives no light.
2) While in STOP mode, press MENU (MENU) to display the TOP MENU.
3) Use the arrows (▲)(▼) to select "BLK BAL" from the TOP MENU. (Figure 3-60)
4) Use the arrows (◀)(▶) to select the black balance.

OFF	No black balance correction
REG	Black balance reflects the corrected data
SET	Calculates black balance correction

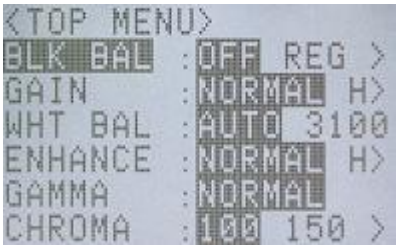


Figure 3-60 BLK BAL(TOP MENU)

- i) Start calculating black balance correction start by selecting "SET".
- ii) It automatically switches to "REG" after black balance correction calculations have been completed.

(Attention) Make sure the lens cap covers the sensor when calculating the black balance correction. Proper correction calculations will not be possible if light gets in to the sensor, and the black level of the resulting image will not be uniform.

3.3.9 White Balance (WHT BAL)

Function that corrects the whiteness when photographing with a light source that has varying levels of color temperature.

- Auto White Balance (Auto Tracking)
  Automatically determines the color temperature from the image signals and implements the proper white balance. Automatically tracks in a color temperature range from 3000K to 9000K.
- Preset White Balance
  Use when the color temperature of the light source is known. The three color temperatures of 3100K, 5000K and 9000K can be set.
- SET/REG White Balance
  Use when precisely setting the white balance or when there is a possibility of changing the color temperature during recording. Photograph a piece of white paper before recording to use this mode.

3.3.9.1 White Balance Settings for Live Images

1) While in VIEW mode, press MENU to display VIEW MENU.
2) Use the arrows to select "WHT BAL" from VIEW MENU. (Figure3-61)
3) Use the arrows to select the white balance.

Figure 3-61 WHT BAL(VIEW MENU)

AUTO	Auto white balance
3100K	When the color temperature of the light source is 3100K
5000K	When the color temperature of the light source is 5000K
9000K	When the color temperature of the light source is 9000K
REG	Use for obtaining data from SET
SET	Calculates current white balance data

- i) First select "SET" to access the SET/REG white balance mode.
  It automatically switches to the auto white balance mode.
- ii) After the white balance calculations have been completed, the white balance data at that point is saved and then it automatically switches to "REG". This data is used if "REG" is selected in any other mode.

3.3.9.2 White Balance Settings for Playback Images

1) While in STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "WHT BAL" from the TOP MENU. (Figure 3-62)
3) Use the arrows to select the white balance.

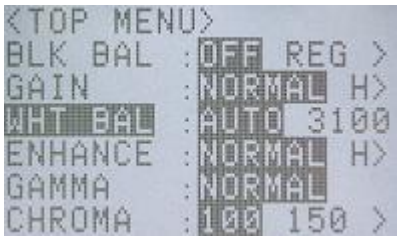


Figure 3-62 WHT BAL(TOP MENU)

AUTO	Auto white balance
3100K	When the color temperature of the light source is 3100K
5000K	When the color temperature of the light source is 5000K
9000K	When the color temperature of the light source is 9000K
REG	Use for obtaining data from SET

3.3.10 Zoom Image (ZOOM)

Displays an enlarged or reduced image.

The display area of the image varies by video output method.

- Display Area for the NTSC Method
  Display the image in an area of 640X480 pixels.
- Display Area for the PAL Method
  Display the image in an area of 768X576 pixels.

If displaying the image on the entire screen, the set frame size will be displayed either enlarged or reduced within the display area. If displaying the image at a fixed rate, the sections outside the display area will be removed and not displayed on the screen.

3.3.10.1 Zooming Live Images

1) While in VIEW mode, press MENU (MENU) to display VIEW MENU.
2) Use the arrows (▲▼) to select "ZOOM" from VIEW MENU. (Figure 3-63)
3) Use the arrows (◀▶) to select the zoom.

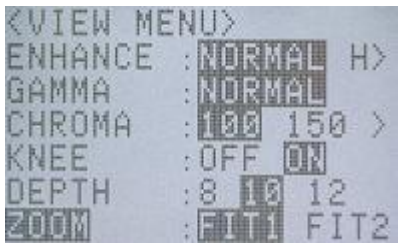


Figure 3-63 ZOOM(VIEW MENU)

FIT1	Display the entire screen in the display area (the entire image can be displayed on an overscan compatible video monitor)
FIT2	Display the entire screen reduced to about 80% of the display area (the entire image can be displayed on standard video monitors)
1/2	Image displayed reduced to ½ size
X1	Image displayed without enlarging or reducing
X2	Image displayed enlarged to double size
X4	Image displayed enlarged to quadruple size

3.3.10.2 Zooming Playback Images

1) While in STOP mode, press MENU (MENU) to display the TOP MENU.
2) Use the arrows (▲▼) to select "SYS MENU" from the TOP MENU.
3) Use the arrows (▲▼) to select "ZOOM" from the SYS MENU. (Figure 3-64)
4) Use the arrows (◀▶) to select the zoom.

Figure 3-64 ZOOM(SYS MENU)

FIT1	Display the entire screen in the display area (the entire image can be displayed on an overscan compatible video monitor)
FIT2	Display the entire screen reduced to about 80% of the display area (the entire image can be displayed on standard video monitors)
1/2	Image displayed reduced to ½ size
X1	Image displayed without enlarging or reducing
X2	Image displayed enlarged to double size
X4	Image displayed enlarged to quadruple size

3.3.11 Scroll Image (SCROLL)

Moves the enlarged image for display.

When an enlarged image is displayed in the display area, the center coordinates of the image are moved and the image not displayed can be shown. With the center coordinates at (0, 0), the photographed image can be moved in single pixel units.

For example, if the zoom setting is "x4" and it is moved +1 in the direction of the X axis, the image shifts 4 pixels to the left on the video monitor. Also, if it is moved +1 in the direction of the Y axis, the image shifts down 4 pixels on the video monitor.

3.3.11.1 Scrolling Live Images

1) While in VIEW mode, press MENU to display VIEW MENU.
2) Use the arrows to select "SCROLL" from VIEW MENU and press SET. (Figure 3-65)
3) Use the arrows to shift the display position in the direction of the X axis.
4) Use the arrows to shift the display position in the direction of the Y axis.
5) Use TRIG to return to the center coordinates (0 0).
6) Press SET again to set the display position.

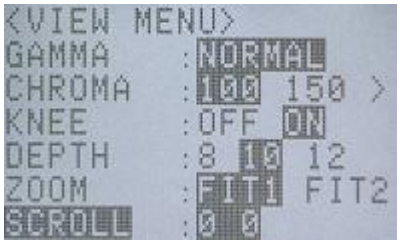


Figure 3-65 SCROLL(VIEW MENU)

3.3.11.2 Scrolling Playback Images

1) While in STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU.
3) Use the arrows to select "SCROLL" from the SYS MENU and press SET. (Figure 3-66)
4) Use the arrows to shift the display position in the direction of the X axis.
5) Use the arrows to shift the display position in the direction of the Y axis.
6) Use TRIG to return to the center coordinates (0 0).
7) Press SET again to set the display position.

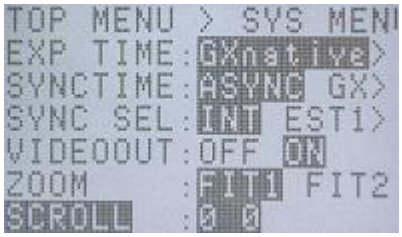


Figure 3-66 SCROLL(SYS MENU)

3.3.12 Low Light Mode Settings (LOWLIGHT)

While in VIEW mode, set the low light mode from VIEW MENU on the JPAD3.

There are times with low light conditions during the prepatory stages of photography when it is not possible to get a crisp live image in VIEW mode. If the low light mode is used in these instances, the image is displayed brighter than images photographed with the set recording speed, making it possible to easily verify the angle of view and the focus.

The low light mode only applies to image display in VIEW mode and does not impact the image displayed in ARM, REC mode or during actual recording. Actual recording is conducted according to the set recording speed.

1) While in VIEW mode, press LOWLIGHT to switch to the low light mode.
2) If changing the low light settings, press MENU to display VIEW MENU.
3) Use the arrows to select "LOWLIGHT" from VIEW MENU. (Figure 3-67)
4) Use the arrows to select the low light mode.

Figure 3-67 LOWLIGHT (VIEW MENU)

100	Displays live image at a photographic speed of 100pps
250	Displays live image at a photographic speed of 250pps
500	Displays live image at a photographic speed of 500pps
1000	Displays live image at a photographic speed of 1000pps
*******p	Low Light Mode Custom Settings

- i) If using custom settings for the low light mode, select "*******p" and press SET .
- ii) Use arrows to move columns and use arrows to change the numerical value. (range: 100～1000pps)
- iii) Press SET again to set the recording speed for the low light mode.

5) Press LOWLIGHT again to return to the normal live image display.
If the lens was adjusted while in the low light mode, be sure to adjust it again.

※ Segment Frame Display

While in the low light mode, the image will be displayed in 1280x960 pixels (zoom setting : 1/2), regardless of the frame size set. The actual frame size will display only the profile of the segment frame.
If the actual frame size recorded is small, the angle of VIEW can be adjusted while viewing the image.

3.3.13 Playback Memory Segment Selection (MEM SEG)

While in STOP mode, the memory segment to be played can be selected from the TOP MENU on the JPAD3.

If there are several memory segments recorded, select the desired memory segment for playback.

1) While in STOP mode, press MENU to display the TOP MENU.
2) Use arrows to select "MEM SEG" from the TOP MENU and press SET to display the sub-menu for MEM SEG. (Figure 3-68). The segment number, recording scene number and trigger time will be displayed.
3) Use arrows to select the desired memory segment and display the recorded image.

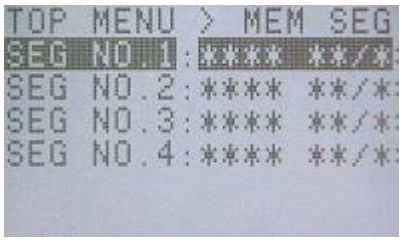


Figure 3-68 MEM SEG

(Figure 3-68 shows 4 memory segments that haven't been recorded yet)

4
Save Settings

4.1 Items That Can Be Set

4.1.1 SAVE MENU Settings

While in REC mode, press MENU to switch from the status screen to the TOP MENU.
Use the arrows to select SAVE MENU from the TOP MENU and then press SET to display the SAVE MENU (Figure 4-1). The following items can be set in the SAVE MENU. (Table 4-1)

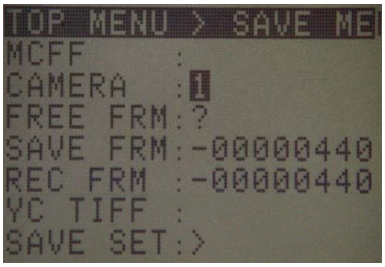


Figure 4-1 SAVE MENU

Table 4-1 SAVE MENU Settings

Settings	Setting Details
MCFF	Saves the video file
CAMERA	Camera number that has been selected
FREE FRM	Displays the number of frames available for recording (display only)
SAVE FRM	Save frame range setting
REC FRM	Displays the recording frame range (display only)
YC TIFF	Save still image file
SAVE SET	Save method settings

After setting in the SAVE MENU, press STOP or MENU to return to the status screen (STOP mode). To return to the TOP MENU select "TOP MENU > SAVE ME" at the top of the SAVE MENU and press SET to return to the TOP MENU.

4.2 Save Settings

4.2.1 Save Frame Range Settings (SAVE FRM)

While in REC mode, the setting for the frame range to be saved can be accessed from the JPAD3 SAVE MENU.

1) First of all, use the arrows to select the camera that saves image, and displays the “STATUS” screen.
2) While in REC mode, press MENU to display the TOP MENU.
3) Use the arrows to select "SAVE MENU" from the TOP MENU and press SET to display the SAVE MENU.
4) Use the arrows to select "SAVE FRM" from the SAVE MENU and press SET (Figure 4-2).
5) Use the arrows to move columns and use the arrows to change the numerical value.
   The start save frame code ・number is before the “－” and the end save frame code ・number is after the “－”.
6) Press SET again to set the save frame range.

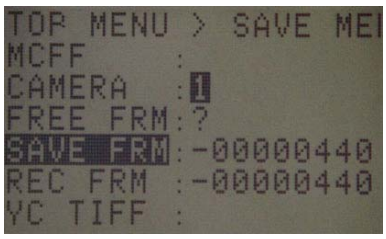


Figure 4-2 SAVE FRM

Set the save frame range so it does not exceed the frame number displayed on the SAVE MENU.

- FREE FRM
  Depending on the capacity of the external storage media memory connected to the J2 cable USB connector, the number of frames that can be saved is displayed.
- REC FRM
  The range for the number of frames recorded is displayed.

4.2.2 Save Method Settings (SAVE SET)

While in REC mode, the save method setting can be accessed from the JPAD3 SAVE MENU.

When saving a recorded image as a video file in an external storage media, the following functions can be set to improve the reliability of the data saved.

- Compare and Rewrite Data (RETRY)
  Compares camera data with data written to the storage media and if a discrepancy is verified, the camera data is rewritten.

- Initialize Media (ERASE)
  Function to write the black image data in advance and initialize the storage media when saving recorded images.
  If there are problems writing data to the storage media, the storage media data will become black image data.

- Error Detection Response (ERROR)
  If there is an error detected or discrepancy found when comparing the data, set to either stop saving or to continue.

1) While in REC mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SAVE MENU" from the TOP MENU and press SET to display the SAVE MENU.
3) Use the arrows to select "SAVE SET" from the SAVE MENU and press SET to display the SAVE SET sub-menu (Figure 4-3).
4) Use the arrows to set the save method functions and select the conditions with the arrows.

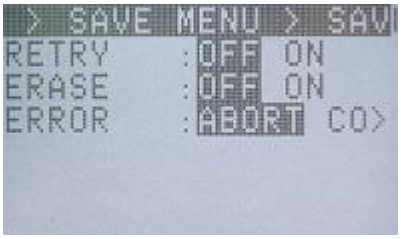


Figure 4-3 SAVE SET

RETRY	OFF	Do not compare data
	ON	Compare data and rewrite
ERASE	OFF	Do not initialize media
	ON	Initialize media
ERROR	ABORT	Display a warning and stop saving when there is a discrepancy between the camera data and the storage media data when an error is detected or the RETRY setting is ON.
	CONTINUE	Display a warning but continue saving even when there is a discrepancy between the camera data and the storage media data when an error is detected or the RETRY setting is ON.

4.2.3 Saving Video Files (MCFF)

While in REC mode, the image recorded from the JPAD3 SAVE MENU can be saved as a video file (MCFF).

1) While in REC mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SAVE MENU" from the TOP MENU and press SET to display the SAVE MENU.
3) Use the arrows to select "MCFF" from the SAVE MENU and press SET to display the transfer mode screen (Figure 4-4).
4) Subsequent steps are identical to those found in【**2.9 Saving**】.

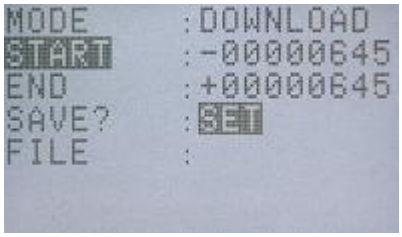


Figure 4-4 Transfer Mode Screen

4.2.4 Saving Still Image Files (YC TIFF)

While in REC mode, the image recorded from the JPAD3 SAVE MENU can be saved as a still image file (YC TIFF).

1) While in REC mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SAVE MENU" from the TOP MENU and press SET to display the SAVE MENU.
3) Use the arrows to select "YC TIFF" from the SAVE MENU (Figure 4-5).
4) Press SET to save the frame displayed at that point as a still image file.

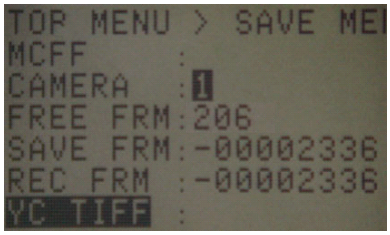


Figure 4-4 Transfer Mode Screen

When saving the file name formatted as “MCYC0000.TIF” will automatically be assigned (Figure 4-6). If the saving is continued the file name will be “MCYC0001.TIF”, and the numeral will show + 1 .

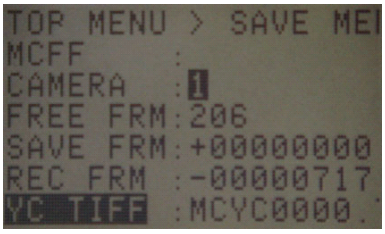


Figure 4-6 Saving YC TIFF

(Blank Page)

5
System Settings

5.1 Items That Can Be Set

The following items related to the system can be set from the following menus using the JPAD3 remote control.

- **TOP MENU**
- **SYS MENU**
- **SYSYTEM SETUP MENU**

5.1.1 TOP MENU Settings

While in the STOP mode, press MENU (MENU) to switch from the status screen to the TOP MENU (Figure 5-1). The following items can be set in the TOP MENU (Table 5-1).

Figure 5-1 TOP MENU

Table 5-1 TOP MENU Settings

Settings	Setting Details	
BLK BAL	Black balance	Refer to Chapter 3 "Recording and Playback Settings"
GAIN	Gain adjustment of playback image	Refer to Chapter 3 "Recording and Playback Settings"
WHT BAL	White balance of playback image	Refer to Chapter 3 "Recording and Playback Settings"
ENHANCE	Enhance correction of playback image	Refer to Chapter 3 "Recording and Playback Settings"
GAMMA	Gamma correction of playback image	Refer to Chapter 3 "Recording and Playback Settings"
CHROMA	Chroma adjustment of playback image	Refer to Chapter 3 "Recording and Playback Settings"
KNEE	Knee adjustment of playback image	Refer to Chapter 3 "Recording and Playback Settings"
RGB COR.	RGB Matrix correction of playback image	Refer to Chapter 3 "Recording and Playback Settings"
LUMINANC	Brightness characteristic setting of playback image	Refer to Chapter 3 "Recording and Playback Settings"
LOCK	PC operation lock setting	Refer to this chapter
MEM SEG	Select the playback memory segment number	Refer to Chapter 3 "Recording and Playback Settings"
SYS MENU	Jump to the SYS MENU	Refer to this chapter
SAVE MENU	Jump to the SAVE MENU	Refer to Chapter 4 "Save Settings"

After completing the settings in the TOP MENU, press STOP or MENU (MENU) to return to the status screen (STOP mode).

5.1.2 SYS MENU Settings

While in the STOP mode, press MENU to switch from the status screen to the TOP MENU. Using the arrows, select "SYS MENU from the TOP MENU and press SET to display the SYS MENU (Figure 5-2). The following items can be set in the SYS MENU (Table 5-2).

Figure 5-2 SYS MENU

Table 5-2 SYS MENU Settings

Settings	Setting Details	
ID	ID number setting	Refer to this chapter
DATETIME	Date and time setting	Refer to this chapter
OSD DISP	Display/do not display superimposed information	Refer to this chapter
OSD MODE	Display/do not display superimposed information by camera mode	Refer to this chapter
OSD TIME	Trigger time display setting	Refer to this chapter
CAFM DIS	Display/do not display mark for center of image	Refer to this chapter
FRM DISP	Frame counter display setting	Refer to this chapter
FRM TIME	Frame time standard setting	Refer to this chapter
TIMSTAMP	Time stamp recording setting	Refer to Chapter 3 "Recording and Playback Settings"
EXP TIME	Exposure timing setting	Refer to Chapter 3 "Recording and Playback Settings"
SYNC TIME	Synchronized time setting	Refer to Chapter 3 "Recording and Playback Settings"
SYNC SEL	Synchronized signal setting	Refer to Chapter 3 "Recording and Playback Settings"
VIDEOOUT	Display/do not display image	Refer to this chapter
ZOOM	Zoom playback image	Refer to Chapter 3 "Recording and Playback Settings"
SCROLL	Scroll playback image	Refer to Chapter 3 "Recording and Playback Settings"
BEEP	Remote control operation sound ON/OFF	Refer to this chapter
AUTOVIEW	Automatic switch to VIEW mode	Refer to this chapter
WARNING	Display/do not display warnings	Refer to this chapter
TRIG SET	External trigger setting, recording method setting	Refer to Chapter 3 "Recording and Playback Settings"
SIG SET	External input/output signal polarity setting	Refer to Chapter 3 "Recording and Playback Settings"
SYS SET	Segment memory setting, reboot	Refer to Chapter 3 "Recording and Playback Settings"
INFO	System information display (cannot be set)	Refer to this chapter

After completing the settings in the SYS MENU, press STOP or MENU to return to the status screen (STOP mode). Also, select "TOP MENU > SYS MEN" at the top of the SYS MENU and press SET to return to the TOP MENU.

5.1.3 SYSTEM SETUP MENU Settings

While in the STOP mode, press STOP, SET and TRIG simultaneously to switch from the status screen to the SYSTEM SETUP MENU (Figure 5-3). The following items can be set in the SYSTEM SETUP MENU (Table 5-3).

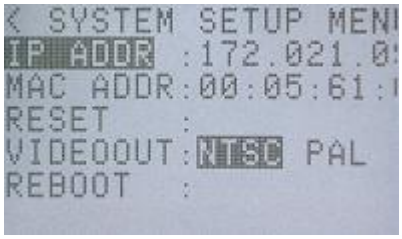


Figure 5-3 SYSTEM SETUP MENU

Table 5-3 SYSTEM SETUP MENU Settings

Settings	Setting Details	
IP ADDR	IP address, sub net mask settings	Refer to this chapter
MAC ADDR	MAC address display (cannot be set)	Refer to this chapter
RESET	Reset settings	Refer to this chapter
VIDEO OUT	Video output method settings	Refer to this chapter
REBOOT	Reboot network	Refer to this chapter

After completing the settings in the SYSTEM SETUP MENU, press STOP or MENU to return to the status screen (STOP mode).

5.2 System Settings

Settings related to the system in Table 5-1, Table 5-2 and Table 5-3 are described below.

5.2.1 Allowed/Prohibited Settings for Operations on the Control PC (LOCK)

While the control PC is connected to the J3 cable ETHER connector, operations on the PC (camera control using the control software GXLink) can be set as allowed/prohibited.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "LOCK" from the TOP MENU (Figure 5-4).
3) Use the arrows to select allow/prohibit operation of the control PC.

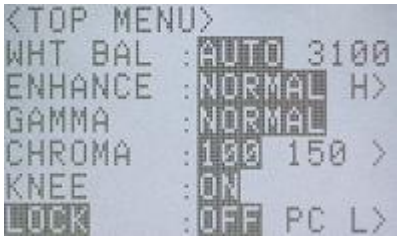


Figure 5-4 LOCK

OFF	PC operation allowed
PC LOCK	PC operation prohibited

5.2.2 ID Number Settings (ID)

The ID number can be set. ID numbers that can be set are from 0~127.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "ID" from the SYS MENU (Figure 5-5).
4) Use the arrows to move columns and use arrows to change the numerical value. (Range of settings: 0～127)
5) Press SET again to set the ID number.

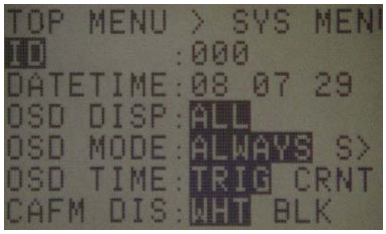


Figure 5-5 ID

5.2.3 Date and Time Settings (DATETIME)

The date and time can be set.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "DATETIME" from the SYS MENU (Figure 5-6).
4) Use the arrows to move columns and use arrows to change the numerical value. Settings of the numbers for the date include year [00～99], month [01～12], day [01～31], hour [00～23], minute [00～59] and second [00～59].
5) Press SET again to set the date and time.

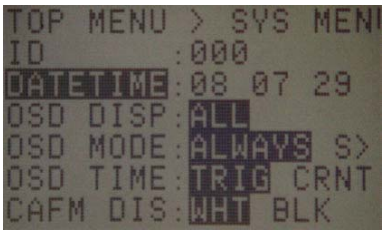


Figure 5-6 DATETIME

5.2.4 Display/Do Not Display Settings for Information Superimposed on the Image (OSD DISP)

It is possible to set display/do not display for the information superimposed on the image (OSD: On Screen Display).

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "OSD DISP" from the SYS MENU (Figure 5-7).
4) Use the arrows to select display/do not display information superimposed on the image. (Figure 5-8)

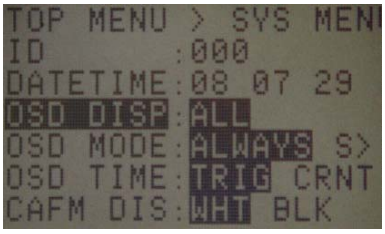


Figure 5-7 OSD DISP

NONE	Do not display superimposed information
FRAME	Display only the frame counter as superimposed information
ALL	Display all superimposed information

OFF FRAME ALL

Figure 5-8 OSD DISP Settings

5.2.5 Display/Do Not Display Settings for Information Superimposed on the Image (OSD MODE)

It is possible to set display/do not display for the information superimposed on the image (OSD: On Screen Display) by camera mode.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select " OSD MODE " from the SYS MENU (Figure 5-9).
4) Use the arrows to select display/do not display information superimposed on the image.

Figure 5-9 OSD MODE

ALWAYS	Superimposed information is displayed in all camera mode.
STOP	Superimposed information is displayed only in the STOP mode.

5.2.6 Trigger time display setting of image (OSD TIME)

The trigger time to which the superimposition is displayed in the image can be set to the trigger time or the present time.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select " OSD TIME " from the SYS MENU (Figure 5-10).
4) Use the arrows to select the trigger time display setting.

Figure 5-10 OSD TIME

TRIG	Display the trigger time
CRNT	Display the present time (clock display)

5.2.7 Display/Do Not Display Settings for the Center Mark of the Image (CAFM DIS)

It is possible to set display/do not display for the center mark of the image (CAFM: Camera Alignment Fiducially Mark）.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "CAFM DISP" from the SYS MENU (Figure 5-11).
4) Use the arrows to select display/do not display for the center mark of the image. (Figure 5-12)

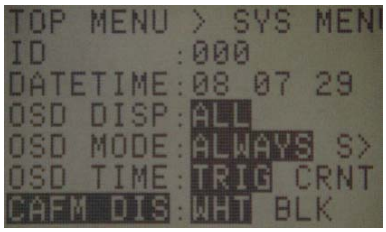


Figure 5-11 CAFM DIS

OFF	Do not display center mark of the image
WHT	Display the center mark of the image in white
BLK	Display the center mark of the image in black

OFF WHT BLK

Figure 5-12 CAFM DIS Settings

5.2.8 Frame Counter Display Settings (FRM DISP)

The units for the frame counter superimposed on the image can be set.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "FRM DISP" from the SYS MENU (Figure 5-13).
   Use the arrows to select the frame counter display (Figure 5-14).

Figure 5-13 FRM DISP

FRAME	Display number of current frame
TIME	Display the time of the current frame as a relative time from the trigger frame
ABS.TIME	Display the absolute time for the current frame
MEMORY%	Display the position of the current frame as a percentage of the recording time

FRAME

TIME

ABS.TIME

MEMORY%

Figure 5-14 FRM DISP Settings

5.2.9 Selection of the Frame Time Standard (FRM TIME)

When setting the frame counter display to a relative time or an absolute time, the time standard can be selected.

- Trigger Signal Input Time
  Using the trigger signal input time during recording as the standard, the time corresponding to the recording speed is calculated for the next frame (Figure 5-15). The advantage of this setting is that it is easy to make the time between each frame uniform.
  However, the frame time cannot be displayed with EST synchronized signal recording.
- Mid-point of the Exposure Start and End Times
  The mid-point of the sensor exposure start and end time becomes the frame time (Figure 5-15). If using the time stamp function, since the image and the time information is saved in the memory, the frame time for the EST synchronized signal recording is also displayed.
  However, if the automatic exposure function (AE) is set, the time between each frame is not uniform.

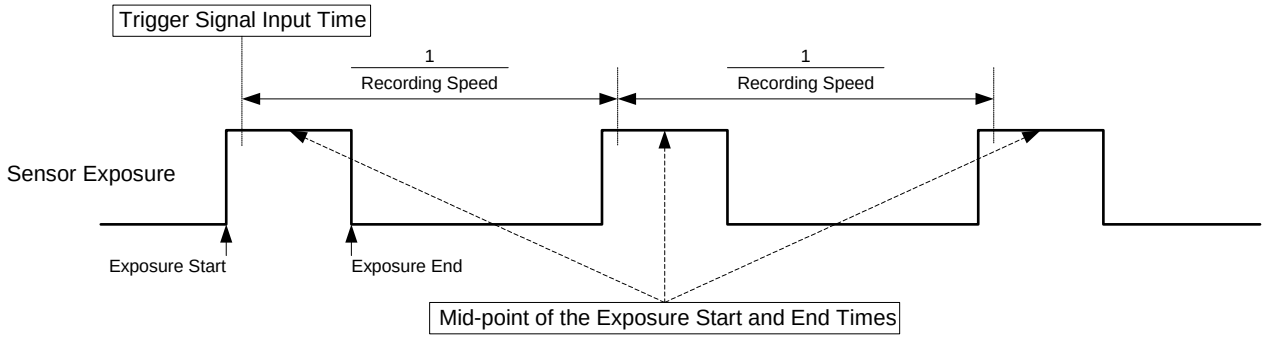


Figure 5-15 Standard Timing for the Frame Time

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "FRM TIME" from the SYS MENU (Figure 5-16).
4) Use the arrows to select the frame time standard.

Figure 5-16 FRM TIME

TRIGGER	Use the trigger signal input time as the standard
EXPOSURE	Use the mid-point of the exposure start and end time as the standard

5.2.10 Image Display/Do Not Display Settings (VIDEOOUT)

It is possible to set display/do not display for the image output to the viewfinder. This is used with a video signal converter.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "VIDEOOUT" from the SYS MENU (Figure 5-17).
4) Use the arrows to select display/do not display the image.

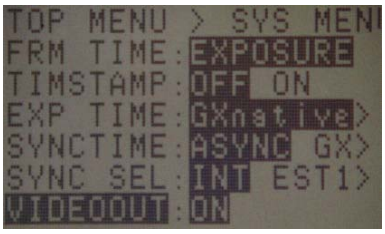


Figure 5-17 VIDEOOUT

OFF	Do not display the image
ON	Display the image

5.2.11 Remote Control Operation Sound Settings (BEEP)

The operation sound for the remote control JPAD3 can be set ON/OFF.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "BEEP" from the SYS MENU (Figure 5-18).
4) Use the arrows to select the remote control operation sound.

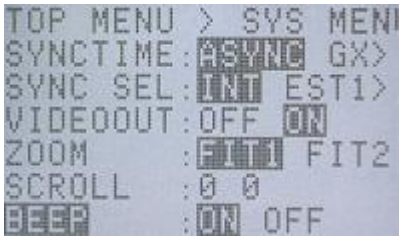


Figure 5-18 BEEP

ON	Operation sound
OFF	No operation sound

5.2.12 Auto View Function Settings (AUTOVIEW)

The auto view functions can be set.

The auto view function automatically switches from REC mode to VIEW mode once recording has been completed.
Once memory segmented recording has been completed, that memory segment (where recording has been completed) automatically switches to the VIEW mode. At this point, press VIEW/ARM to switch to the next memory segment and switch to the ARM mode.

Auto view cannot be used for a recording method in the AUTO mode or the LOOP mode. If the recording method is set to the AUTO mode or LOOP mode, the auto view function will not function.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "AUTOVIEW" from the SYS MENU (Figure 5-19).
4) Use the arrows to select the auto view function.

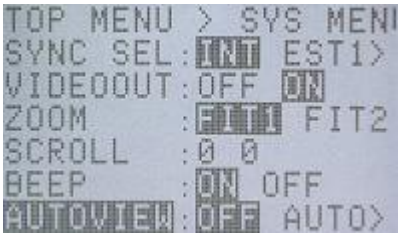


Figure 5-19 AUTOVIEW

OFF	Auto view function OFF
AUTO	The auto view function is repeated until the final memory segment (switches to memory segments where recording has been completed, cannot overwrite images)
LOOP	The auto view function is repeated until stopped (press STOP) (switches to memory segments where recording has been completed, cannot overwrite images) (After recording the last memory segment, it returns to the first memory segment)

(Attention) Images saved to the memory are deleted when overwritten by a new image when switched to the ARM mode. Switch to the ARM mode only after verifying whether or not it is acceptable to erase the images saved in the next memory segment.
Save important images to a USB compatible memory media or to the control PC. Refer to **【2.10 Saving】** or **【GXLink User's Manual】** for the method of saving images.

5.2.13 Display/Do Not Display Warning Settings (WARNING)

It is possible to set display/do not display warning messages for live images.

- Battery Warning（BATTERY）
  Warning when the voltage of the input power source is low or abnormal.
- RTC Battery Warning (RTC BATT)
  Warning when the internal timer battery voltage is low.
- Abnormal Recording Speed Warning (FRM RATE)
  Warning when the recording speed cycle is not within the tolerance range.
- Abnormal Interruption of Camera Display Warning (IRQ)
  Warning when the recording display interruption signal goes out.

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "WARNING" from the SYS MENU and press SET to display the WARNING sub-menu. (Figure 5-20)
4) Select the warnings to be set and use the arrows to select display/do not display for the warnings.

Figure 5-20 WARNING

BATTERY	ON	Display battery remaining warning
	OFF	Do not display battery remaining warning
RTC BATT	ON	Display RTC battery warning
	OFF	Do not display RTC battery warning
FRM RATE	ON	Display abnormal recording speed warning
	OFF	Do not display abnormal recording speed warning
IRQ	ON	Display abnormal camera display interruption warning
	OFF	Do not display abnormal camera display interruption warning

5.2.14 System Information Display (INFO)

Displays the system information. These settings cannot be changed.

- Model name (MODEL)
- Firmware version (VERSION)
- Camera ID number (CID)
- Memory capacity (MEM SIZE)
- Hardware revision (REVISION)
- Network connections (NETWORK)
- IP address, sub net mask (IP ADDR)
- MAC address (MAC ADDR)
- Total operation time (ELAPSED)
- Display the port number while displaying image.
- Kind of camera head under connection

1) While in the STOP mode, press MENU to display the TOP MENU.
2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
3) Use the arrows to select "INFO" from the SYS MENU and press SET to display the INFO sub menu (Figure 5-21).
4) Use the arrows and the arrows to verify all of the system information.

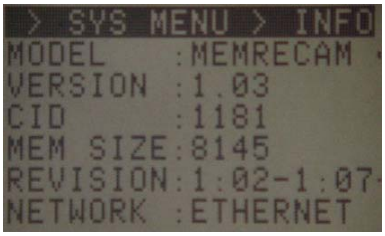


Figure 5-21 INFO

5.2.15 Network Settings (IP ADDR)

The IP address and sub net mask can be set.

1) While in the STOP mode, simultaneously press STOP, SET and TRIG to display the SYSTEM SETUP MENU.
2) Use the arrows to select "IP ADDR" from the SYSTEM SETUP MENU and press SET (Figure 5-22).
   The IP address and sub net mask will be displayed.
3) Use the arrows to move columns and use the arrows to change the numerical value.
4) Press SET again to set the IP address and sub net mask.

5) Use the arrows to select "REBOOT" and press SET (Figure 5-23).
   Restart the system using "REBOOT" to show the IP address and sub net mask.

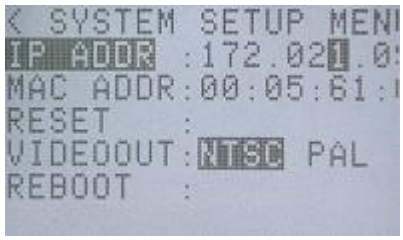


Figure 5-22 IP ADDR

Figure 5-23 REBOOT

5.2.16 Reset Settings (RESET)

Reverts all of the settings to the factory settings.

1) While in the STOP mode, simultaneously press STOP, SET and TRIG to display the SYSTEM SETUP MENU.
2) Use the arrows to select "RESET" from the SYSTEM SETUP MENU and press SET (Figure 5-24).

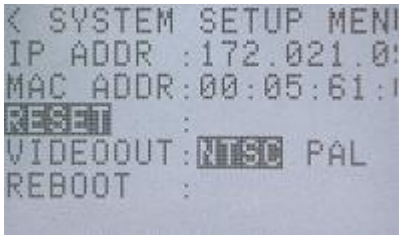


Figure 5-24 RESET

3) Use the arrows to select "REBOOT" and press SET (Figure 5-25).
Restart the system using "REBOOT" to show the new settings.

Figure 5-25 REBOOT

5.2.17 Video Output Method Selection (VIDEOOUT)

Either NTSC or PAL can be selected as the video output method.

1) While in the STOP mode, simultaneously press STOP, SET and TRIG to display the SYSTEM SETUP MENU.
2) Use the arrows to select "VIDEOOUT" from the SYSTEM SETUP MENU (Figure 5-26).
3) Use the arrows to select the video output method.

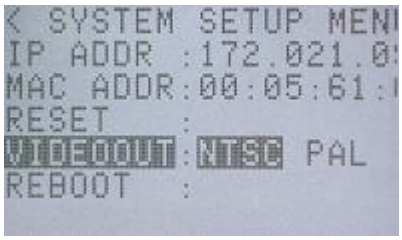


Figure 5-26 VIDEOOUT

NTSC	The video output method is NTSC
PAL	The video output method is PAL

4) Use the arrows to select "REBOOT" and press SET (Figure 5-27).
Restart the system using "REBOOT" to show the video method.

Figure 5-27 REBOOT

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6
Troubleshooting

6.1 Troubleshooting

The following suggestions are provided on the causes of potential problems during use of the MEMRECAM GX-5 and their solutions.

6.1.1 The VIEW Mode Cannot Be Accessed

Cause ①

The view mode can't be accessed when any camera head is not connected with an effective port.

Solution

Please do the camera configuration setting with the camera head connected. Please refer to 【2.4 camera configuration setting】 for the camera configuration settings.

Cause ②

It may not become VIEW Mode by warning message which is displayed.

Solution

Please execute VIEW after pressing "STOP", and deleting the warning message.

6.1.2 The ARM Mode Cannot Be Accessed

Cause ①

After recording in the AUTO mode, the memory segment where recording has been completed is memory protected and overwriting data by recording (ARM mode) is prohibited.

Solution

Try the following solutions.

- Recording in the AUTO mode can be performed again by erasing the data in the memory. Erase the data in the memory according to the **【3.2.11 Memory Segment Settings】.**
- Select a recording method other than the AUTO mode from **【3.2.13 Recording Method Selection】** to enable data to be overwritten.

(Attention) Before performing the aforementioned solutions, verify that the data can be erased or overwritten by recording. Essential images should be saved on a USB compatible storage media or the control PC. Refer to **【2.10 Saving】** or **【GXLink User's Manual】** for the method of saving images.

Cause ②

After setting the auto view function in the AUTO mode and recording, the memory segment where recording has been completed is memory protected and overwriting data by recording (ARM mode) is prohibited.

Solution

Try the following solutions

- Recording can be performed using the auto view function set in the AUTO mode by erasing the data in the memory. Erase the data in the memory according to the **【3.2.11 Memory Segment Settings】**.
- Turn the auto view function OFF or set to LOOP according to **【5.2.10 Auto View Function Settings】** to enable overwriting data.

(Attention) Before performing the aforementioned solutions, verify that the data can be erased or overwritten by recording. Essential images should be saved on a USB compatible storage media or the control PC. Refer to **【2.10 Saving】** or **【GXLink User's Manual】** for the method of saving images.

6.1.3 Trigger Input Does Not Work With The Remote Control JPAD3

Cause

When the recording method is set to burst recording, the trigger input does not work with the remote control JPAD3, and only functions with external trigger input.

Solution

Input external trigger signals from the J1 cable TRIG1 or J3 cable TRIG2 (option) during burst recording.

6.1.4 External Trigger Input Does Not Work

Cause ①

The two systems for external trigger input include the J1 cable TRIG1 and the J3 cable TRIG2 (option). When one was set as the valid trigger input, it is possible that the trigger system used did not match the trigger system set.

Solution

Follow【**3.2.12 External Trigger Signal Selection**】 to select the trigger system that matches the trigger system to be used.

Cause ②

It is possible that signals valid as recording trigger signals were not input. Also, if the polarity setting to detect the trigger is incorrect, the trigger input for the desired timing won't work.

Solution

Verify input of the valid trigger signals using【**7.5 Input/Output Connectors**】 and【**APPENDIX A**】. Also, follow 【**3.2.16 External Input/Output Signal Polarity Selection**】to make sure that the correct polarity is either positive or negative to enable trigger input with the desired timing

6.1.5 The EST Signals Are Not Synchronized

Cause ①

The two systems to set EST input include the J1 cable EST1 and the J3 cable EST2 (option). When one was set as the valid EST input, it is possible that the EST input system used did not match the EST input system set.

Solution

Select the EST input system that is the same as the EST input system to be used, based on【**3.2.15 Synchronized Signal Settings**】.

Cause ②

There is a possibility that the proper EST signal is not input. Also, if the polarity setting to detect the EST signal is incorrect, synchronized recording for the desired timing won't work.

Solution

Verify that the proper EST signal is input based on【**3.2.15.2.1 Precautions for Use**, 【**7.5 Input/Output Connector**】and【**APPENDIX B**】. Also, follow 【**3.2.16 External Input/Output Signal Polarity Selection**】 to make sure that the correct polarity is either positive or negative to enable EST synchronized signal recording with the desired timing

6.1.6 Not Synchronized with the IRIG Time

Cause ①

It is possible that the synchronization time is not set to the IRIG time.

Solution

Set the synchronization time to IRIG time according to【**3.2.14 Synchronization Time Settings**】.

Cause ②

It is possible that the proper IRIG-B time code is not input.

Solution

Verify【**7.5 Input/Output Connector**】, and 【**APPENDIX E**】and input the proper IRIG-B time code.

6.1.7 Response to System Crashes

If, for some reason, the system crashes, unplug the AC adapter power switch and reboot. If it starts up properly, it returns to the state immediately prior to recording so download the images backed up in the memory using a USB storage media.

7
Specifications

7.1 Imager

7.1.1 Image Sensor

In general, CCD camera used well and the same optical size 1/2 inch 300,000 pixel color or monochrome solid state image sensor(CMOS sensor)

7.1.2 Recording Speeds

1） With Preset Recording speeds 50、60、100、250、500、750、1,000、1,500、2,000、2,500、3,000、4,000、5,000、6,000、8,000、10,000、15,000、20,000、25,000、30,000、40,000、50,000、60,000、80,000、100,000

2） With Custom Recording speeds 50～100,000 pps、1pps increments

3） Using EST and Custom Recording speed Function
0～135,869 pps

Note) pps: picture per second, frames/second

7.1.3 Recording Speed and Pixels

1） The maximum recording speed during presets and the pixels/area size

Frame Size (Maximum Recording Speed)		Pixels	Image Area Size
Full：V G A	(1,000pps or less)	640(H)X480(V)	6.34(H)X4.75(V) mm
Split 4:3	(1,000pps or less)	576(H)X432(V)	5.70(H)X4.28(V) mm
Split 4:3	(1,500pps or less)	512(H)X384(V)	5.07(H)X3.80(V) mm
Split 4:3	(2,000pps or less)	448(H)X336(V)	4.44(H)X3.33(V) mm
Split 4:3	(3,000pps or less)	384(H)X288(V)	3.80(H)X2.85(V) mm
Q V G A	(4,000pps or less)	320(H)X240(V)	3.17(H)X2.37(V) mm
Split 4:3	(6,000pps or less)	256(H)X192(V)	2.53(H)X1.90(V) mm
Split 4:3	(10,000pps or less)	192(H)X144(V)	1.90(H)X1.43(V) mm
Split 4:3	(15,000pps or less)	128(H)X96(V)	1.27(H)X0.95(V) mm
Split 4:3	(50,000pps or less)	64(H)X48(V)	0.63(H)X0.48(V) mm
Split	(100,000pps or less)	32(H)X16(V)	0.32(H)X0.16(V) mm

Note 1) The number of pixels saved in the memory is the same as the number of available pixels.
Note 2) The sensor central accuracy relative to the central light axis is ±0.28mm.
Note 3) 1,000pps or less is 50, 60, 100, 250, 500, 750, and 1,000. However, the shutter time of 50 and 60pps is 10ms at most.

2） Custom Settings for the Frame Size
The horizontal pixels can be set in 32 pixel increments, and the vertical pixels can be set in 16 pixel increments.

7.1.4 Sensitivity

1） Color — ISO1,000 (F/4, gain NORMAL, 1000pps)
Corresponds to ISO500/1,000/2,000 (gain LOW/NORMAL/HIGH)

2） Black and White — ISO4,000 (F/4, gain NORMAL, 1000pps)
Corresponds to ISO2,000/4,000/8,000 (gain LOW/NORMAL/HIGH)

Note) Subject illuminance refers to the illuminance when the output signal for the subject at 89% of the reflectance is 100%.
The aperture value is the lens aperture at that point

7.1.5 Shutter

1） Shutter method — Electronic shutter

2） Preset exposure times

OPEN(＝1/ recording speed),1/100,1/250,1/500,1/1,000,1/2,000,
1/5,000,1/10,000,1/20,000,1/50,000,1/100,000,1/200,000
1/333,333 seconds

Shutters with Fixed Exposure Time Settings（Example：Pixels 640X480）

Exposure Time (Sec) \ Recording Speed (pps)	50	60	100	250	500	750	1000
1/50	×	×	×	×	×	×	×
1/60	×	×	×	×	×	×	×
1/100	○	○	○*	×	×	×	×
1/250	○	○	○	○*	×	×	×
1/500	○	○	○	○	○*	×	×
1/750	△	△	△	△	△	○*	×
1/1,000	○	○	○	○	○	○	○*
1/1,500	△	△	△	△	△	△	△
1/2,000	○	○	○	○	○	○	○
1/5,000	○	○	○	○	○	○	○
1/10,000	○	○	○	○	○	○	○
1/20,000	○	○	○	○	○	○	○
1/50,000	○	○	○	○	○	○	○
1/100,000	○	○	○	○	○	○	○
1/333,333	×	×	×	×	×	×	×

Note 1) It is not possible to set exposure times longer than 1／recording speed.
Note 2) ○ refers to shutter exposure times that can be set. △ refers to shutter exposure times that cannot be set with a preset
Note 3) △ refers to the ability to custom set shutter.
Note 4) * refers to an open shutter (＝1/ recording speed)
Note 5) If using a shutter exposure time where the settings for the recording speed and pixels cannot be changed, the shutter is open or the exposure time is at the minimum. If setting the shutter to open or the minimum exposure time, those settings will remain even if the recording speed or pixels are changed.
Note 6) It is horizontal pixel count 608 or less that can set the shutter for 1/333,333 seconds.
Note 7) It is not changeable in the recording speed and the pixel count that cannot be set. Therefore, please increase the pixel count after previously changing the recording speed small to increase the pixel count. Please make the recording speed fast after previously changing the pixel count few to make the recording speed fast.

3） Custom Shutter Exposure Times 1～9996 microseconds, 1 or 2 microsecond increments

Possible Settings and Intervals for Exposure Times

Photographic Speed (pps)	Pixels (HxV)	Setting (us)		Setting Intervals (us)
		Maximum	Minimum	
100 or less	640x480	9996	4	1 or 2
250	640x480	3996	4	1 or 2
500	640x480	1995	4	1 or 2
1,000	640x480	997	4	1 or 2
2,000	448x336	497	3	1 or 2
3,000	384x288	329	2	1 or 2
4,000	320x240	246	2	1
6,000	256x192	163	2	1
10,000	192x144	96	1	1
15,000	128x96	63	1	1
50,000	64x48	17	1	1
100,000	32x16	7	1	1

Note 1) The exposure times that can be set with the custom shutter are automatically calculated by the firmware.

7.1.6 Lens Mount

NF-mount (full size）

7.1.7 Compatibility with the Previous Series

The MEMRECAM GX-5 uses shutter exposure start timing as the standard. When MEMRECAM ci and fx do the exposure end timing or another expression of the shutter, the image sensor reading start timing is a standard.

Therefore, the exposure time shifts when there is a multi camera completely synchronized system with a combination of the previous camera series and the GX-5.

Since the GX-5 has a compatible mode for the previous series of cameras, it is necessary to set the exposure time (EXP TIME) to K3 compat for mixed systems.

With only GX-5, or with multi camera synchronized systems with cameras from other companies using exposure start timing as the standard, set the exposure time (EXP TIME) to GX native.

Note 1) With a combination of MEMRECAM fx-K4/K5 and GX-5, set the K4/K5 exposure time to 'standard' and either set the GX-1 exposure time to 'K4 compat' or set the K4/K5 exposure time to 'legacy' and the GX-5 exposure time to 'K3 compat'.

Note 2) With a multi camera synchronized system, if the fx series cameras other than the MEMRECAM ci series and fx-K4/K5, have open shutters at less than 1000pps, the exposure time will shift, so don't use the shutter OPEN, please.

7.1.8 Length of camera cable

The length of the cable of each camera head may be different in GX-5 though all the lengths of the camera cable had to be made the same in the RX-5 pencil.

7.2 Recorder

7.2.1 Memory

1） Installed Memory　　It is possible to select it from 2/4/8GB.

Variable-length memory record allocation（VRMS：Variable Recording Memory Sharing）

The recording time can be extended by decreasing the number of cameras.

2） With memory segments

The memory can be used by dividing. A separate scene of each segment can be recorded by dividing the image memory into two or more segments. The recording image of two or more scenes is maintained, and it is possible to download it later collectively. The automatic segment switch function is provided.

Segment Size：It becomes the following corresponding to the memory capacity.

Number of camera head	Installed Memory	Segment size and number of segments						
		1	2	4	8	16	32	64
1	2GB	2.0GB	1.0GB	524MB	262MB	131MB	65MB	-
	4GB	4.2GB	2.1GB	1.0GB	530MB	265MB	132MB	66MB
	8GB	8.5GB	4.2GB	2.1GB	1.0GB	533MB	266MB	133MB
2	2GB	1.0GB	524MB	262MB	131MB	65MB	-	-
	4GB	2.1GB	1.0GB	530MB	265MB	132MB	66MB	-
	8GB	4.2GB	2.1GB	1.0GB	533MB	266MB	133MB	-
3	2GB	699MB	349MB	174MB	87MB	-	-	-
	4GB	1.4GB	707MB	353MB	176MB	88MB	-	-
	8GB	2.8GB	1.4GB	711MB	355MB	177MB	-	-
4	2GB	524MB	262MB	131MB	65MB	-	-	-
	4GB	1.0GB	530MB	265MB	132MB	66MB	-	-
	8GB	2.1GB	1.0GB	533MB	266MB	133MB	-	-
5	2GB	419MB	209MB	104MB	-	-	-	-
	4GB	849MB	424MB	212MB	106MB	-	-	-
	8GB	1.7GB	854MB	427MB	213MB	-	-	-
6	2GB	349MB	174MB	87MB	-	-	-	-
	4GB	707MB	353MB	176MB	88MB	-	-	-
	8GB	1.4GB	711MB	355MB	177MB	-	-	-
7	2GB	299MB	149MB	74MB	-	-	-	-
	4GB	606MB	303MB	151MB	75MB	-	-	-
	8GB	1.2GB	610MB	305MB	152MB	-	-	-
8	2GB	262MB	131MB	65MB	-	-	-	-
	4GB	530MB	265MB	132MB	66MB	-	-	-
	8GB	1.0GB	533MB	266MB	133MB	-	-	-

The recording time in the memory segment reaches the value in which the recording time in each memory capacity is divided by the number of camera head × number of segments.

7.2.2 Recording Bit Length

The number of recording bits a pixel can be selected from 8/10 bit image.

- **10 bit**　It is the same as a previous fx series. It becomes a standard image quality.
- **8 bit**　The top 10 bit (0～1024) are saved as 0～127, 128～255 saved as 128～191, 256～511 are saved as 192～223 and 512～1023 are saved as 224～255. The image quality is low but the recording time is extended and the data size is reduced.

7.2.3 Recording Times

The next table shows the recording times by combining the possible recording speeds with preset settings and the frame sizes. The condition in the following table is a value when 10 bits in the recording bit length and 2 camera head connecting it. "×" indicates that settings cannot be combined.

Recording Times for Preset Settings (sec) (Installed Memory 2GB)

Frame Size [pixel] / Recording Speed [pps]	640x480	576x432	512x384	448x336	384x288	320x240	256x192	192x144	128x96	64x48	32x16
50	54.6	67.42	85.32	111.44	151.68	218.36	341.04	605.72	1358.98	5352.84	29143.32
60	45.5	56.18	71.1	92.87	126.4	181.97	284.2	504.77	1132.48	4460.7	24286.1
100	27.3	33.71	42.66	55.72	75.84	109.18	170.52	302.86	679.49	2676.42	14571.66
250	10.92	13.48	17.06	22.29	30.34	43.67	68.21	121.14	271.8	1070.57	5828.66
500	5.46	6.74	8.53	11.14	15.17	21.84	34.1	60.57	135.9	535.28	2914.33
750	3.64	4.49	5.69	7.43	10.11	14.56	22.74	40.38	90.6	356.86	1942.89
1000	2.73	3.37	4.27	5.57	7.58	10.92	17.05	30.29	67.95	267.64	1457.17
1500	×	×	2.84	3.71	5.06	7.28	11.37	20.19	45.3	178.43	971.44
2000	×	×	×	2.79	3.79	5.46	8.53	15.14	33.97	133.82	728.58
2500	×	×	×	×	3.03	4.37	6.82	12.11	27.18	107.06	582.87
3000	×	×	×	×	2.53	3.64	5.68	10.1	22.65	89.21	485.72
4000	×	×	×	×	×	2.73	4.26	7.57	16.99	66.91	364.29
5000	×	×	×	×	×	×	3.41	6.06	13.59	53.53	291.43
6000	×	×	×	×	×	×	2.84	5.05	11.32	44.61	242.86
8000	×	×	×	×	×	×	×	3.79	8.49	33.46	182.15
10000	×	×	×	×	×	×	×	3.03	6.79	26.76	145.72
15000	×	×	×	×	×	×	×	×	4.53	17.84	97.14
20000	×	×	×	×	×	×	×	×	×	13.38	72.86
25000	×	×	×	×	×	×	×	×	×	10.71	58.29
30000	×	×	×	×	×	×	×	×	×	8.92	48.57
40000	×	×	×	×	×	×	×	×	×	6.69	36.43
50000	×	×	×	×	×	×	×	×	×	5.35	29.14
60000	×	×	×	×	×	×	×	×	×	×	24.29
80000	×	×	×	×	×	×	×	×	×	×	18.21
100000	×	×	×	×	×	×	×	×	×	×	14.57

Recording Times for Preset Settings (sec) (Installed Memory 4 GB)

Frame Size [pixel] / Recording Speed [pps]	640x480	576x432	512x384	448x336	384x288	320x240	256x192	192x144	128x96	64x48	32x16
50	110.52	136.44	172.68	225.52	306.92	441.88	690.12	1225.66	2749.84	10831.1	58969.48
60	92.1	113.7	143.9	187.93	255.77	368.23	575.1	1021.38	2291.53	9025.92	49141.23
100	55.26	68.22	86.34	112.76	153.46	220.94	345.06	612.83	1374.92	5415.55	29484.74
250	22.1	27.29	34.54	45.1	61.38	88.38	138.02	245.13	549.97	2166.22	11793.9
500	11.05	13.64	17.27	22.55	30.69	44.19	69.01	122.57	274.98	1083.11	5896.95
750	7.37	9.1	11.51	15.03	20.46	29.46	46.01	81.71	183.32	722.07	3931.3
1000	5.53	6.82	8.63	11.28	15.35	22.09	34.51	61.28	137.49	541.56	2948.47
1500	×	×	5.76	7.52	10.23	14.73	23	40.86	91.66	361.04	1965.65
2000	×	×	×	5.64	7.67	11.05	17.25	30.64	68.75	270.78	1474.24
2500	×	×	×	×	6.14	8.84	13.8	24.51	55	216.62	1179.39
3000	×	×	×	×	5.12	7.36	11.5	20.43	45.83	180.52	982.82
4000	×	×	×	×	×	5.52	8.63	15.32	34.37	135.39	737.12
5000	×	×	×	×	×	×	6.9	12.26	27.5	108.31	589.69
6000	×	×	×	×	×	×	5.75	10.21	22.92	90.26	491.41
8000	×	×	×	×	×	×	×	7.66	17.19	67.69	368.56
10000	×	×	×	×	×	×	×	6.13	13.75	54.16	294.85
15000	×	×	×	×	×	×	×	×	9.17	36.1	196.56
20000	×	×	×	×	×	×	×	×	×	27.08	147.42
25000	×	×	×	×	×	×	×	×	×	21.66	117.94
30000	×	×	×	×	×	×	×	×	×	18.05	98.28
40000	×	×	×	×	×	×	×	×	×	13.54	73.71
50000	×	×	×	×	×	×	×	×	×	10.83	58.97
60000	×	×	×	×	×	×	×	×	×	×	49.14
80000	×	×	×	×	×	×	×	×	×	×	36.86
100000	×	×	×	×	×	×	×	×	×	×	29.48

Recording Times for Preset Settings (sec)　(Installed Memory　8 GB)

Frame Size [pixel] / Recording Speed [pps]	640x480	576x432	512x384	448x336	384x288	320x240	256x192	192x144	128x96	64x48	32x16
50	222.34	274.48	347.38	453.68	617.46	888.9	1388.28	2465.56	5531.56	21787.66	118621.8
60	185.28	228.73	289.48	378.07	514.55	740.75	1156.9	2054.63	4609.63	18156.38	98851.5
100	111.17	137.24	173.69	226.84	308.73	444.45	694.14	1232.78	2765.78	10893.83	59310.9
250	44.47	54.9	69.48	90.74	123.49	177.78	277.66	493.11	1106.31	4357.53	23724.36
500	22.23	27.45	34.74	45.37	61.75	88.89	138.83	246.56	553.16	2178.77	11862.18
750	14.82	18.3	23.16	30.25	41.16	59.26	92.55	164.37	368.77	1452.51	7908.12
1000	11.12	13.72	17.37	22.68	30.87	44.45	69.41	123.28	276.58	1089.38	5931.09
1500	×	×	11.58	15.12	20.58	29.63	46.28	82.19	184.39	726.26	3954.06
2000	×	×	×	11.34	15.44	22.22	34.71	61.64	138.29	544.69	2965.55
2500	×	×	×	×	12.35	17.78	27.77	49.31	110.63	435.75	2372.44
3000	×	×	×	×	10.29	14.82	23.14	41.09	92.19	363.13	1977.03
4000	×	×	×	×	×	11.11	17.35	30.82	69.14	272.35	1482.77
5000	×	×	×	×	×	×	13.88	24.66	55.32	217.88	1186.22
6000	×	×	×	×	×	×	11.57	20.55	46.1	181.56	988.52
8000	×	×	×	×	×	×	×	15.41	34.57	136.17	741.39
10000	×	×	×	×	×	×	×	12.33	27.66	108.94	593.11
15000	×	×	×	×	×	×	×	×	18.44	72.63	395.41
20000	×	×	×	×	×	×	×	×	×	54.47	296.55
25000	×	×	×	×	×	×	×	×	×	43.58	237.24
30000	×	×	×	×	×	×	×	×	×	36.31	197.7
40000	×	×	×	×	×	×	×	×	×	27.23	148.28
50000	×	×	×	×	×	×	×	×	×	21.79	118.62
60000	×	×	×	×	×	×	×	×	×	×	98.85
80000	×	×	×	×	×	×	×	×	×	×	74.14
100000	×	×	×	×	×	×	×	×	×	×	59.31

7.2.4 Live Image Display

The live images during camera photography (VIEW, ARM, REC) are displayed in color.

1）	NTSC	Update rate：30 frames/sec
2）	PAL	Update rate：25 frames/sec

7.2.5 Recording Trigger Mode

1） Recording Method

Normal	Normal trigger mode
Event Trigger	The initial trigger signal is the trigger and the second and subsequent trigger signals are saved as events. With an input pulse of 15 (16 when combined with the initial trigger), it is possible to use a frame jump or an on-screen display mark.
Burst Trigger	Recording performed when the trigger signal is ON
Multi Trigger	The selected memory segments are segmented into 1～16 blocks (can be increased by individual units), and recording is performed by automatically switching each trigger signal into blocks.

2） Trigger Timing (normal, event, multi trigger settings)

START	The trigger point is the frame about 5% past the beginning of the recording memory
CENTER	The trigger point is the mid-point (about 50%) of the recording memory
END	The trigger point is the frame about 5% just before the end of the recording memory
CUSTOM	The trigger point is a frame for a predetermined numerical value (corresponding to -100～100%). It can be set in 1% increments. Reference) - 100%～- 1% corresponds to the delay trigger

Note 1) Writing begins to the recording memory in the ARM mode even without trigger input. After switching to the ARM mode, images recorded previously cannot be played back.

Note 2) The recording range can be slightly adjusted depending on the trigger timing.

Note 3) Depending on the recording method settings, the recording speed and the relationship of the trigger timing, it may not be possible to record into the entire recording memory, and only partial recording is possible. For example, if END is set, recording is ended at a point about 5% from the trigger input to the recording memory so if there is trigger input before 95% or more has elapsed from the start of ARM, the portion shorter than 95% will not be saved.

Note 4) When the event trigger is selected, and the trigger timing is set to less than 0% of CUSTOM, the event cannot be recorded.

7.2.6 Synchronized Data Save During Recording

1） Closed Caption Method (method where images and information are saved separately but displayed together)

The recorded scene number, recorded trigger mode setting, recording speed, frame size, shutter exposure time, recorded image quality setting, recording comments and the trigger time are saved in the system controller at the time of trigger input.

2） Synchronized Save Method (method where images and information are saved and displayed together)

The internal standard time information (or IRIG-B time), exposure start time, exposure end time, trigger signal, event signal and IRIG lock are saved in the image memory.

3） Frame Synchronized Save Data (time stamp)

① Exposure start time (in min, sec and usec units)
② Exposure end time (in min, sec and usec units)
③ Frame count (memory address information)
④ Trigger time (in day, hour, min, sec and usec units)
⑤ Sequence count (save sequence information)
⑥ Trigger, EST, event, IRIG lock (flag bit identification)
⑦ Recorded time (day, hour, min, sec)

The time stamp can be turned ON/OFF.

7.3 Video Converter

It is a video output for the viewfinder. The image of one camera is switched and displayed.

1）	Output Signal	NTSC / PAL method analog signal, 75Ω, 1 V(p-p)
	Image update rate	30 frame／sec (NTSC), 25frame／sec (PAL)
	Display area	640x480(NTSC), 768x576(PAL)
2）	Gradation	Y, Cb, Cr each 8 bit (internal digital final stage)
3）	Image Quality Settings	
	Gain	LOW, NORMAL, HIGH
	White balance	AUTO, 3100K, 5000K, 9000K, REG
	Enhance	OFF, LOW, NORMAL, HIGH
	Gamma	OFF, LOW, NORMAL
	Chroma	0%, 50%, 100%, 150%, 200%
	Knee	OFF, ON
	RGB Matrix	OFF, ON
	Luminance	NORMAL, LINEAR
4）	Display	
	Zoom	FIT1 (display the entire screen at 100%), FIT2 (NTSC : display the entire screen reduced about 80%, PAL : display the entire screen reduced about 83%),1/2, 1x, 2x, 4x
	Scroll	The zoomed image is cut to the display area for display. Coordinates are set using the center of the image as the origin, and the display position can be moved.
5）	Segment frame display	Segment frame displayed in VIEW mode or LOW LIGHT mode. Can be used in conjunction with zoom display.
6）	Display mark at the center of the image	Cross can be displayed as the mark at the center of the image: CAFM(Camera Alignment Fiducial Mark). Select either white or black.
7）	Playback display	
	Playback speed (NTSC)	Forward, 1～1920 frames/sec, both forward and reverse
	Playback speed (PAL)	Forward, 1～2000 frames/sec, both forward and reverse
	Frame jump	Trigger frame, recording start frame, recording end frame
	Playback mode	Single playback (PLAY mode), loop playback (LOOP mode)
	Playback range settings	Playback start frame and playback end frame settings
8）	Video output control	Video output can be set to ON/OFF
9）	Camera switching	When two or more camera heads are connected, it is possible to select it.

7.4 System Controls

7.4.1 Operation by the main body Switch

・POWER Switch：Rotary type（OFF、REMOTE、ON）

Note) When REMOTE is set, the power supply of DRP, JPAD3 (Option), and LCD FINDE (Option) is turned on and off simultaneously with the power supply of GX-HUB.
The power supply is turned on when it is not connected to GX-HUB.

7.4.2 Status Display on the Main Unit LED

1） POWER LED(PW)

Lit green	Power ON	(Normal)
Lit red	Power ON	(Fail)
OFF	Power OFF	

Note) Fail indicates the presence of any one of camera startup, failure detected, abnormal power voltage detected, elevated sensor temperature detected, trigger abnormal detection or setting abnormal detection

2） CAMERA MODE LED（CM）

Orange	REC	REC mode (Camera image output, saving in the camera image memory after trigger detection)
Blue	STOP	STOP mode (Memory image output. Immediately after startup, either the playback mode or the transmission mode)
White	VIEW	VIEW mode (Camera image output, memory contents retained after save completed)
Magenta	ARM	ARM mode (camera image output, memory contents discarded after save completed and camera image being saved in memory)
Not lit	OFF	Power OFF, or starting up
Flashing	EST	Set in EST mode, and EST pulse input Only with VIEW, ARM, REC modes

3） MEMORY BACKUP LED（MB）：As stated in 7.4.4

4） ETHERNET LED（ET）：

Lit green	Network connection
Flashing green	Network communicating
Not lit	Network not connected or power OFF

5） USB LED（UB）：

Lit green	Device connected
Not lit	Device not connected or power OFF

7.4.3 Display of camera head connection state with port LED

The state of the camera head connection is displayed with LED of each camera port.

Display color state of lighting	It is possible to take a picture	state of camera head connection	State of port(setting)
Not lit	－	Before startup	-
Flashing green(quickly)	－	While startup	-
Flashing yellow(slowly)	△	Usable	Invalid
Flashing yellow(quickly)	×	Not connected	Effective
Lit yellow	×	Not connected	Invalid
Lit green	○	Usable	Effective
Flashing red(quickly)	×	Unusable	Effective
Lit red	×	Unusable	Invalid

7.4.4 Video Output On Screen Display

1）	Mode display	LLIGHT (LOW LIGHT), STOP, VIEW, ARM, REC, FAIL
2）	Recording speed	50～100,000 (pps units in integers), EST
3）	Shutter	1/100～1/333,333, 1～9996 (micro units in integers), OPEN
4）	Trigger timing	START, CENTER, END, -100～+100(% units in integers)
5）	Frame count	The current screen display frame number (integer) with the trigger frame at 0, or the relative time for the current screen display with the trigger frame as time 0 (fx compatible function, unit: microseconds, 24 hour system). Switch according to the menu.
6）	Time	Exposure center time (unrelated to the trigger frame) for the current screen display
7）	Warning display	

Abnormal recording speed (ON/OFF)
Abnormal camera interruption (ON/OFF)
Sensor temperature out of valid range
Camera head not connected
Abnormal camera head communication
Abnormal camera head EEPROM
Abnormal recording start
Abnormal recording cancel
Abnormal I2C device communication
Abnormal input voltage (low voltage : 19V or less)
Abnormal input voltage (high voltage : 33V or more)
Low memory backup battery warning (ON/OFF)
Imminent cutoff of memory backup battery voltage
VIEW/ARM start trigger signal assert
BlackBalance data imbalance
Startup error
RTC battery out (ON/OFF)
BlackBalance data generation error
USB HDD format error
USB HDD save error
MCFF transmission error
USB driver deadlock
USB driver timeout
Image memory protection
Camera FPN data error

7.4.5 Remote Control JPAD3

System controller settings and verification can be made with the remote control JPAD3.
Bold indicates factory settings.

1） Status Display 1

Displayed in the VIEW, ARM, REC and LOW LIGHT modes other than the menu mode.When it is selected excluding "TIME", use the arrows to select port, and it switches the camera that the video display selected.

・MODE	Display mode
・FRM RATE	Display recording speed, with a direct setting button
・FRM SIZE	Display frame size (valid pixels)
・SHUTTER	Display shutter, with a direct setting button
・TRIGGER	Display trigger, with a direct setting button
・ID	Display ID number
・SCENE	Display scene number
・PLAY	Display playback speed
・FRAME	Display frame counter
・TIME	Display frame time
・CAMERA	Port number display while video is displayed

2） Status Display 2

Displayed in the STOP, PLAY and LOOP modes other than the menu mode. When it is selected excluding "TIME", use the arrows to select port, and it switches the camera that the video display selected.

- MODE — Display mode
- FRAME — Display frame counter
- TIME — Display frame time
- PLAY — Display playback speed
- FRM RATE — Display recording speed
- FRM SIZE — Display rime size (valid pixels)
- SHUTTER — Display shutter
- TRIGGER — Display trigger
- ID — Display ID number
- SCENE — Display scene number
- CAMERA — Port number display while video is displayed
- Bar display — Display playback range toolbar, playback range and current playback position displayed relative to all of the saved range

3） Recording Setup Menu (VIEW MENU)

Access this menu with the "MENU" button while in the VIEW mode. Set the items needed for recording.

- SCENE — Scene number settings, 0～65535 (automatic increments)
- TRIGGER — Trigger mode settings, START, **CENTER**, END, CUSTOM
- FRM RATE — Recording speed settings, refer to the【7.1 imager】(**1000**)
- FRM SIZE — Frame size settings, refer to the【7.1 imager】(**1280x1024**)
- CUSTOM F — Custom recording speed/frame size setting menu
  - PRIORITY — Priority settings, **RATE**, SIZE
  - FRM RATE — Recording speed settings
  - FRM SIZE — Frame size settings
- SHUTTER — Shutter exposure time settings, refer to the【7.1 imager】(**OPEN**)
- LOWLIGHT — Low light mode settings, **100**, 250, 500, 1000, CUSTOM
- GAIN — Gain settings, LOW, **NORMAL**, HIGH
- WHT BAL — White balance settings, **AUTO**, 3100, 5000, 9000, REG, SET
- ENHANCE — Enhance settings, OFF, LOW, **NORMAL**, HIGH
- GAMMA — Gamma settings, OFF, LOW, **NORMAL**
- CHROMA — Chroma settings, 0, 50, **100**, 150, 200
- KNEE — Knee settings, OFF, **ON**
- RGB COR. — RGB Matrix Settings, **OFF**, ON
- LUMINANC — Luminance characteristic settings, **NORMAL**, LINEAR
- DEPTH — Bits saved settings, 8, **10**, 12
- ZOOM — Zoom display settings, **FIT1**, FIT2, 1/2, x1, x2, x4
- SCROLL — XY coordinate settings and display **0 0** (center of the screen) set using arrows. Trigger button targets the center of the screen.

4） General Setup Menu (TOP MENU)

Access this menu with the "MENU" button while in the STOP mode. Perform playback settings, system settings and saving data.

- BLK BAL — Black balance settings, **OFF**, REG, SET
- GAIN — Playback gain settings, LOW, **NORMAL**, HIGH
- WHT BAL — Playback white balance settings, **AUTO**, 3100, 5000, 9000, REG,
- ENHANCE — Playback enhance settings, OFF, LOW, **NORMAL**, HIGH
- GAMMA — Playback gamma settings, OFF, LOW, **NORMAL**
- CHROMA — Playback chroma settings, 0, 50, **100**, 150, 200
- KNEE — Playback knee settings, OFF, **ON**
- RGB COR. — Playback RGB Matrix settings, **OFF**, ON
- LUMINANC — Playback luminance characteristic settings, **NORMAL**, LINEAR
- LOCK — PC operation lock settings, **OFF**, PC LOCK

・MEM SEG　Memory segment menu,　refer to 4.1)
・SYS MENU　System menu,　refer to 4.2)
・SAVEMENU　Save menu,　refer to 4.3)

4.1）Memory Segment Menu（MEM SEG）

Segment number and trigger time are displayed in a table to select the memory segment.

4.2）System Menu（SYS MENU）

・ID　ID number settings,　**0**～127
・DATETIME　Date and time settings,　year, month, day, hour, minute, second
・OSD DISP　Video OSD display settings,　OFF, FRAME, **ALL**
・OSD MODE　Video OSD display setting in camera mode, **ALWAYS**, STOP
・OSD TIME　Trigger time display settings, **TRIG**, CRNT
・CAFM DIS　Video image center mark settings,　**OFF**, WHT, BLK
・FRM DISP　Frame number display settings,　frame number (**FRAME**), time elapsed from trigger input (TIME), absolute time (ABS.TIME), memory%
・FRM TIME　Frame time standard settings,　trigger (**TRIGGER**), exposure center (EXPOSURE)
・TIMSTAMP　Time stamp record settings,　**OFF**, ON
・EXP TIME　Exposure time settings
　GX native　Internal standard time ＝ Start exposure
　K3 compat　Internal standard time ＝ End exposure
　K4 compat　Internal standard time ＝ End exposure (K4/K5)
・SYNC TIME　Synchronized time selection,　**ASYNC**(internal camera), GX-HUB, IRIG
・SYNC SEL　Synchronized signal selection,　**INT**(internal camera), EST1, EST2
・VIDEOOUT　Video output settings,　OFF, **ON**
・ZOOM　Zoom settings,　**FIT1**, FIT2, 1/2, x1, x2, x4
・SCROLL　XY coordinate settings and display **0 0**(center of the screen) set using arrows. Trigger button targets the center of the screen.
・BEEP　Remote control BEEP sound settings,　OFF, **ON**
・AUTOVIEW　After recording has been completed, automatically sets to the view mode then switches the memory segment with the next ARM command. **OFF**, AUTO, LOOP. AUTO stop when all of the memory segments have been saved, and overwriting is only performed in LOOP. Only the STOP command stops LOOP. If the REC MODE in the trigger setting menu is used to set modes with (A)(L)(C) other than NORMAL, EVENT, BURST, it has priority, and this function does not work.
・WARNING　Warning settings menu
　BATTERY　Low battery warning,　**OFF**, ON
　RTC BATT　RTC battery warning,　**OFF**, ON
　FRM RATE　Abnormal recording speed warning,　**OFF**, ON
　IRQ　Monitor abnormal camera interruption,　**OFF**, ON
・TRIG SET　Trigger settings menu
　TRIG SEL　Trigger signal selection,　**TRIG1**(J1 connector), TRIG2(J3 connector)
　REC MODE　**NORMAL**　Normal recording
　NORMAL(A)　Normal recording (A)
　NORMAL(L)　Normal recording (L)
　EVENT　Event recording
　EVENT(A)　Event recording (A)
　EVENT(L)　Event recording (L)
　BURST　Burst recording
　BURST(A)　Burst recording (A)
　BURST(L)　Burst recording (L)
　MULTI(A)　Multi trigger recording (All blocks)
　MULTI(C)　Multi trigger recording (continuous)
　MULTIS(A)　Multi trigger recording (All blocks)(A)

	MULTIS(L) Multi trigger recording (All blocks)(L) Above, AUTO is abbreviated as (A), and is an automatic segment switch and save in all segments, LOOP is abbreviated as (L), and is an automatic segment switch and overwrite in the memory segments. Only the STOP command stops LOOP. (C) is an abbreviation of CONTINUATION. Modes with (A) (L) (C) have priority over the AUTO VIEW function.
BLOCKS	Multi trigger block settings, **2**~16
・SIG SET	Input/output signal settings menu
TRIG1	J1 trigger input polarity settings, POSI(rising), **NEGA**(falling edge)
TRIG2	J3 trigger input polarity settings, **CRNTON**(current ON), CRNTOFF(current OFF)
EST1	J1 EST1 input polarity settings, POSI(rising), **NEGA**(falling edge)
EST2	J3 EST2 input polarity settings, POSI (rising), **NEGA**(falling edge)
EPO	J3 EPO output polarity settings, POSI (exposing during H), **NEGA**(exposing during L)
ARM CMD	J2 ARM command input polarity settings, POSI(rising), **NEGA**(falling edge)
ARM STS	J1 ARM status output polarity settings, POSI(ARM during H), **NEGA** (ARM during L)
FAULT	J1 FAULT status output polarity settings, POSI(FAULT during H), **NEGA** (FAULT during L)
TRIGFLT	Trigger filter settings, **200.0**、0.0～6553.5 (in usec units)
EST FLT	EST filter settings, **0.0**～6553.5 (in usec units)
・SYS SET	System settings menu
SEG SIZE	Memory segment settings, 2GB : **1**～16 4GB : **1**～32 8GB : **1**～64
CAMCFG	Execution of camera configuration settings
REBOOT	Reboot with network settings
・INFO	Information display menu
MODEL	Display model name
VERSION	Display camera software version (firmware)
CID	Display camera ID number
MEM SIZE	Display memory capacity
REVISION	Display camera hardware revision
NETWORK	Display network
IP ADDR	Display IP address, sub net mask
MAC ADDR	Display MAC address
ELAPSED	Display total elapsed time
CAMERA	Port number display while video is displayed
CAMTYPE	Kind of camera head under connection, P1V1
4.3）Save Menu（SAVE MENU）	
・MCFF	Save in MCFF format, Show saved file name after saved
・CAMERA	Display camera number that has been selected.
・FREE FRM	Frames available for saving display
・SAVE FRM	Display and settings for range saved to USB external media
・REC FRM	Recording frame range display
・YC TIFF	Save still image with VGA resolution being displayed in YC TIFF format, Show saved file name after saved
・SAVE SET	Save settings menu
RETRY	Compare data and if there is a discrepancy, retry **OFF**, ON
ERASE	Black data erase, **OFF**, ON
ERROR	Operation settings when error detected, **ABORT**, CONTINUE

5） Direct Data Save Mode

Access this menu with the direct "DOWNLOAD" button while in the STOP mode. Press "SET" to start saving, and press "SET" when save is completed to return to the STOP mode.

・MODE	Display mode
・START	Display start frame
・END	Display end frame
・SAVE	Press "SET" to start saving
・FILE	Display file name
・Bar display	Toolbar to save data, display progress of save

6） System Setup Menu (SYSTEM SETUP MENU)

Perform system settings. While in the STOP mode, access this menu by pressing "STOP"+"TRIG"+"SET" simultaneously

・IP ADDR	Network settings, IP address, sub net mask settings (At shipment there is a nac private address ClassB set. Do not connect directly to the internet.)
・MAC ADDR	Display MAC address
・RESET	Reset function, returns to factory settings for that shown in **bold**.
・VIDEO	Video output method settings, **NTSC**, PAL
・REBOOT	Reboot system

7.4.6 Memory Backup

After recording has been completed, protects the contents of the recorded image when the power switch has been turned off or the power cord has been disconnected. When power is turned on, it returns to the identical state immediately after recording.

1） Battery

Type	Nickel cadmium: D X 6 piece
Nominal Capacity	2000 mAh
Nominal Voltage	7.2V
Life	1 年

The batteries are not rechargeable. The life of the batteries may vary dramatically depending on the ambient temperature and conditions of use. It is possible to use batteries past their shelf life but there is a possibility they may not meet specifications and so should be replaced annually.

2） Backup Time

2ＧＢ	1 hour
4ＧＢ	1 hour
8ＧＢ	1 hour

3） Backup Start Conditions

After recording has been completed, if the DC input voltage to the MEMRECAM main unit is 19. 0V or less.

4） Charging

Time	Approximately 10 hours(from completely dead battery to full charge)
Start Conditions	With an external power source for the DC input connector of this unit.

Note ） Since it is designed to reduce deterioration due an overcharged battery, it is possible to extend the life of the battery by avoiding continuous charging for three days or more.

5） Battery Status Display

The battery status is shown by the color of the MB LED on the front panel of the camera.

5.1） Color Shown

Color Shown	Charge Remaining
Red	Low
Orange	Medium
Green	High

Since there are differences in batteries and the ambient temperature, the display is not precise. Use as directed. If the color of the flashing LED changes from orange to red while backing up, charge as soon as possible (connect the external power source to the DC input connector of the camera). Otherwise, the excessive discharge protective function is activated and the images in the memory are lost.

5.2） Display Lit, Flashing

Lit ・Flashing	Backup Status
Lit	Backing up with an external power source
Flashing	Backing up with the battery
Not lit	Backup OFF

If valid image data is not saved in the memory, the backup does not start.

5.3） Replacing Batteries

With normal use (charge and discharge several times per day at normal temperatures), the life is about one year but the life can vary depending on storage temperatures, the number of charges and the time of continuous charging.

During actual use, the time for the color of the flashing LED to turn red may be shortened in spite of an adequate charge, which may impact the use.

Avoid using or storing in locations of high temperatures will extend the life of the battery.

Using nickel cadmium batteries improves the efficiency of the memory when the battery is completely discharged, and thus extends the life of the battery.

Please contact the shop or our company about the battery replacement.

7.5 Input/Output Connector

7.5.1 J1 Connector

1） Connector

ID color	Yellow
Name	TRIG&STATUS
Connector name	LEMO EGG.2B.310
Plug name	LEMO FGG.2B.310

2） EST1 Input

Signal level	TTL level, 5V pull up resistance 4700Ω, insulation
	L level：- 0.5VDC (minimum applied voltage) ~0.8VDC
	H level：2VDC~5.5VDC(maximum applied voltage)
Function	Exposure starts H→L, photographs one image.
	Synchronization delay 1.5μsec or less. Reverse polarity function.

Refer to APPENDIX B for details.

3） TRIG1 Trigger Input

Signal level	TTL level, 5V pull up resistance 4700Ω, insulation
	L level：- 0.5VDC (minimum applied voltage) ~0.8VDC
	H level：2VDC~5.5VDC(maximum applied voltage)
Function	Trigger valid H→L. Contact input available.
	Polarity reversal function.

Refer to APPENDIX A for details.

4） ARM Status Output

Signal level	Open collector output, insulation
	Maximum applied voltage 50VDC, maximum current 100mA
Function	Short circuit in the ARM mode. Reverse polarity function.

Refer to APPENDIX D for details.

5） FAULT Status Output

Signal level	Open collector output, insulation
	Maximum applied voltage 50VDC, maximum current 100mA
Function	Short circuit with FAULT status. Reverse polarity function.

Refer to APPENDIX D for details.

7.5.2 J2 Connector

1） Connector

ID color	Green
Name	VF & J-PAD
Connector name	LEMO EGG.2B.316
Plug name	LEMO FGG.2B.316

2） ARM Command Input

Signal level	TTL level, 5V pull up resistance 4700Ω, insulation
	L level：- 0.5VDC (minimum applied voltage) ~0.8VDC
	H level：2VDC~5.5VDC (maximum applied voltage)
Function	H→L for ARM mode. Reverse polarity function.

Refer to APPENDIX D for details.

3） DC24V Output

Signal level	Power input through output
	No protective circuit, maximum output current：1A

4） VIDEO Output

Method	NTSC / PAL
Signal level	1V(p-p), 75Ω, no insulation

5） USB

Standard	USB 2.0 Standard, insulation

6） RS232

Standard	RS-232C Standard, no insulation, but only with TXD and RXD.
Function	For JPAD3(remote controller) connection

7.5.3 J3 Connector

1） Connector

ID color	Blue
Name	REMOTE
Connector name	LEMO EGG.2B.318
Plug name	LEMO FGG.2B.318

2） Ethernet

Standard	1000BASE-T(IEEE 802.3 ab), 100BASE-TX(IEEE 802.3 u), 10BASE-T(IEEE 802.3) insulation

3） EST2 / EVENT Input

Signal level	TTL level, 5V pull up resistance 4700Ω, insulation L level：- 0.5VDC (minimum applied voltage) ~0.8VDC H level：2VDC~5.5VDC (maximum applied voltage)
Function	With EST input, exposure starts H→L photographs one image. Reverse polarity function. Synchronization delay 1.5μsec or less. During EVENT input, the signal level is saved along with the image.

Refer to APPENDIX B for details.

4） IRIG-B Input

Signal level	3 V(p-p)(1～10 V(p-p)), high impedance, insulation
Standard	IRIG Standard 200-98

Refer to APPENDIX E for details.

5） TRIG2 Trigger Input

Signal level	Current loop with photo coupler, insulation Current limiter resistance 1500Ω, maximum applied voltage ±32V
Function	Trigger valid at 5V or more. Reverse polarity function.

Refer to APPENDIX A for details.

6） EPO Output

Signal level	TTL level, insulation. Reverse polarity function.

Refer to APPENDIX C for details.

Note) Only when the camera head is connected to CAM PORT1, the exposure pulse is output.

7） Power Control

Signal level	TTL level, 5V pull up resistance 4700Ω, insulation L level：- 0.5VDC (minimum applied voltage) ~0.8VDC H level：2VDC~5.5VDC (maximum applied voltage)
Function	Power ON with H, power OFF with L. No reverse polarity function.

Refer to APPENDIX D for details.

7.5.4 Power Connector

1）	Name	PWR
2）	Connector name	LEMO EGG.2B.303
	Plug name	LEMO FGG.2B.303
3）	Input Power	
	Power voltage	DC20－32V
	Input power	DC power (AC adapter) or the included battery
	Power consumption	Approximately 105W(DRP : Approximately 75W) Eight camera head connection, ARM mode、DC24V when not connected to a peripheral device Power consumption that increases and decreases with one camera head: Approximately 5.5W
	Power protection	
	Reverse polarity	internal fuse (replaceable by user)
	Excess charge	35VDC, 1 minute

With remote power control function (Refer to【7.5.3】)

7.5.5 PORT1～PORT8 Connector

1） Connector Name LEMO EGG.2B.326
Plug Name LEMO FGG.2B.326

2） Camera head connection signal, Camera head power supply

7.5.6 Pin Numbers

1） J1 Connector

1	DC24V IN
2	DC24V RTN
3	EST1 IN
4	EST1 IN RTN
5	TRIG1 IN
6	TRIG1 IN RTN
7	ARM status out
8	ARM status out RTN
9	FAULT status out
10	FAULT status out RTN
shell	FRAME GND

2） J2 Connector

1	ARM command IN
2	ARM command IN RTN
3	USB VBUS
4	USB D－
5	USB D＋
6	USB GND
7	NC
8	NC
9	DC24V OUT (Viewfinder power)
10	DC24V OUT RTN
11	VIDEO OUT (NTSC/PAL signal)
12	VIDEO OUT RTN
13	TXD OUT (REMOCON RS-232C)
14	RXD IN (REMOCON RS-232C)
15	DC24V OUT (REMOCON power)
16	TXD, RXD RTN
shell	FRAME GND

3） J3 Connector

1	MDI 0+ 10/100/1000BASE-T Interface
2	MDI 0- 10/100/1000BASE-T Interface
3	MDI 1+ 10/100/1000BASE-T Interface
4	MDI 1- 10/100/1000BASE-T Interface
5	MDI 2+ 10/100/1000BASE-T Interface
6	MDI 2- 10/100/1000BASE-T Interface
7	MDI 3+ 10/100/1000BASE-T Interface
8	MDI 3- 10/100/1000BASE-T Interface
9	EST2/EVENT IN
10	EST2/EVENT IN RTN
11	IRIG-B IN
12	IRIG-B IN RTN
13	TRIG2 IN A (anode)
14	TRIG2 IN C (cathode)
15	EPO
16	EPO RTN
17	POWER CONT IN
18	POWER CONT RTN
shell	FRAME GND

4） Power Connector

1	DC24V IN
2	FRAME GND
3	DC24V RTN
shell	FRAME GND

5） PORT1～PORT8 Connector

1	DTC+
2	DTC -
3	CTD0+
4	CTD1+
5	CTD1-
6	CTD2+
7	CTD2-
8	CTD4+
9	CTD4-
10	CTD5+
11	CTD5-
12	CTD6+
13	CTD7+
14	CTD7-
15	NC
16	CTD0-
17	NC
18	CLK+
19	CLK-
20	NC
21	NC
22	CTD6-
23	CTD3+
24	CTD3-
25	DC16V IN
26	DC16V RTN
shell	FRAME GND

7.6 Environment

1）	Operating temperature and humidity	0~40℃, 30~80%RH (no condensation)
2）	Saving temperature and humidity	-10~60℃、20~80%RH(no condensation)
3）	Vibration	MIL-STD-810C METHOD 514.2 CATEGORY b2 standard (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
4）	Shock	DRP : Half-sine, 11msec, 100G Camera Head : Half-sine, 11msec, 150G

7.7 Shape

7.7.1 DRP

1）	Exterior dimensions	Approximately W290 × H142 × D240mm(excluding connector, protruding parts and options)
2）	Weight	2／4／8GB Model : Approximately 13 kg (excluding cables, handle, and options) Handle (including screws) Approximately 0.14kg

7.7.2 Camera Head

1） Exterior dimensions (excluding lens, connector, protruding parts and options)

	SS Type	Approximately W25×H25×D85mm
	SA Type	Approximately W25×H25×D88mm
	AS Type	Approximately W25×H25×D94mm
	AA Type	Approximately W25×H25×D97mm
	AR Type	Approximately W25×H25×D95mm
	Pig tail connector	
2） Weight	Only Camera Head Main body	Approximately 100g
	Camera Head＋Cable	Approximately 630g
3） Tripod mounting screw hole	1/4-20UNC DEPTH6mm (for tripod plate use) Tripod plate is option.	
4） Tripod plate mounting screw	M2X8mm 2screw	

7.8 Adaptive Standards

1） Safety standard	EN60950
2） Electromagnetic adaptability	EN55022 EN55024 FCC Part 15 Class A

7.9 Accuracy

1） Recording time accuracy ±0.01%(or 10^{-4}) or less

The inverse of the recording speed (frequency) during a given time (1 sec or more) is used as the time accuracy.

2） Method of determining recording time accuracy

The EPO signal output from the J3 connector measures the frequency with the frequency counter for the recording speed during a given time (1 sec or more).

7.10 Replaceable Parts

Replaceable parts are not covered by the warranty.

1） Memory Backup Batteries Refer to【7.4.6】

2） Clock Batteries

Clock batteries are used in the camera. These batteries last approximately 8 years. Since the time will not be correct when the batteries fail, it will be necessary to reset the time each time the power is turned ON. Since the clock batteries are soldered, the camera must be returned to the factory for replacement.

7.11 Specifications of the Main Attachments

7.11.1 AC Adapter (no G-resistant function) (Option)

1）	Input	AC100~240V, 47~63Hz Connector：AC 3 pin connector
2）	Output	DC26V, 240W at this point, the efficiency is at least 83% Connector：EGG.2B.303.CYM_ LEMO
3）	Operating temperature and humidity	-10～+50℃, 10～90%RH, no condensation
4）	Storage temperature and humidity	-10～+75℃, 10～90%RH, no condensation
5）	Exterior dimensions	Approximately W150 x H70 x D340 mm (not including connector)
6）	Weight	Approximately 1.7kg
7）	Power switch	Yes, with guard

Note) Ground the AC 3 pin connector. If not grounded, electrical shock may occur when the camera or GX-HUB is touched.

7.11.2 Control Software (Option)

1）	Platform	Windows 2000 SP4 / Windows XP Professional SP2
2）	Compatible cameras	MEMRECAM fx/GX series
3）	Function	Camera control (preview, recording, playback, download), playback image files, image quality adjustment, format conversion, coordinate measurement, save analog waveform (playback (can be synchronized with the camera), file output)
4）	Input image files	MCFF, CIF, AVI, TIFF, JPEG, BMP
5）	Output image files	MCFF, AVI, TIFF, JPEG, BMP
6）	Other files	FCV(conversion settings), TXT(scene information), CSV(analog waves, measurement data)

It is possible to superimpose the recording information on the conversion image. Superimposed recording information can add outside the image area when the pixel count is small and the superimposed font size is the following conditions.

Large : Vertical line 408 or less, medium : vertical line 432 or less, small : vertical line 448 or less.

Note) The optional external signal storage unit is required for analog waveforms

7.11.3 Cables

1） Simple J1 Cable

P1	Camera plug	(ID color：yellow)	LEMO FGG.2B.310
P11	TRIG1	Trigger 1 input	BNC plug

2） Simple J2 Cable

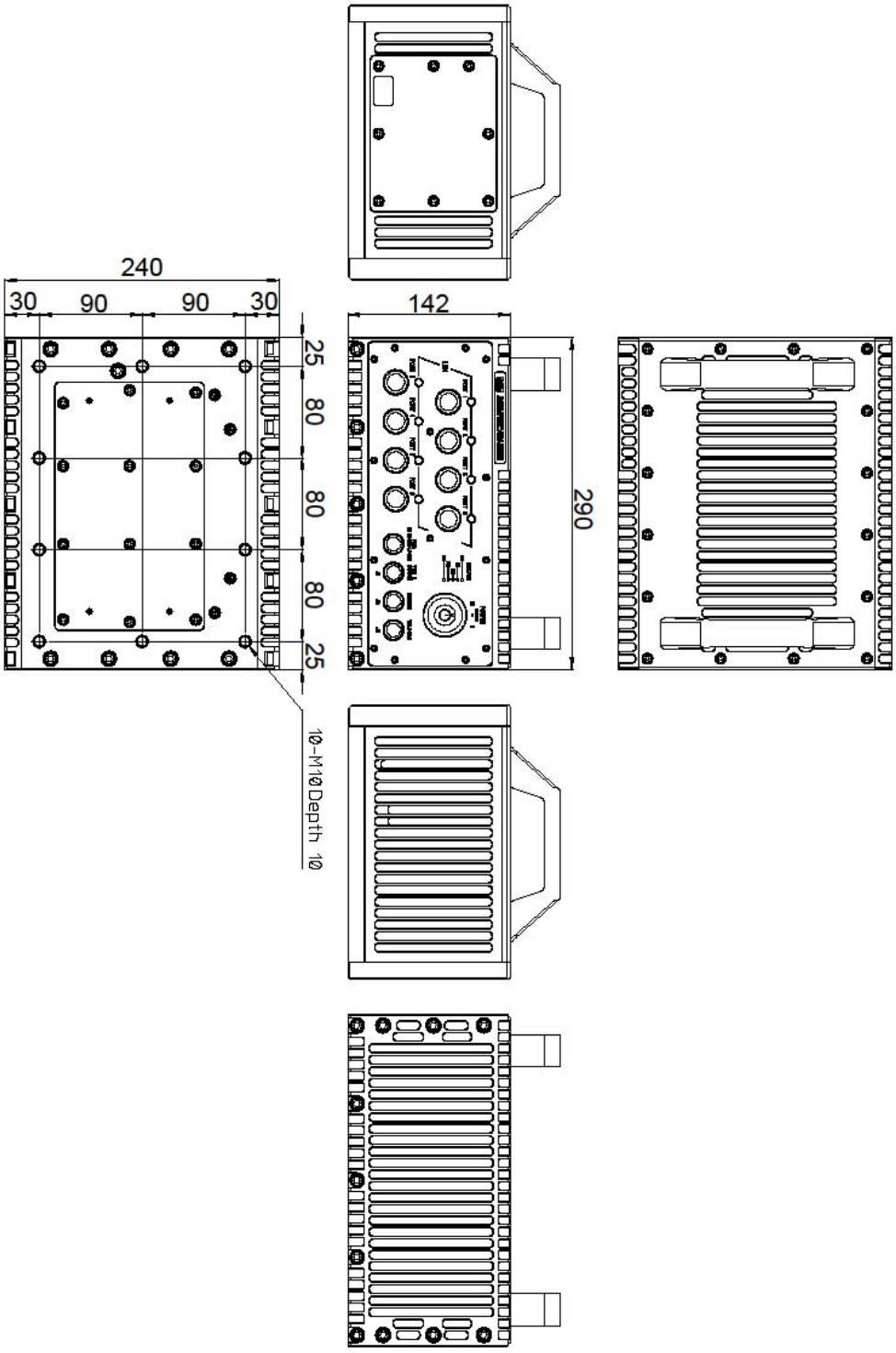
P 2	Camera plug	(ID color：green)	LEMO FGG.2B.316
P21	USB	USB	USB series A plug
P22	VF	Viewfinder	Hirose HR10A-7P-6S(73)
P23	JPAD	JPAD3	LEMO PHG.0B.306

3） Simple J3 Cable

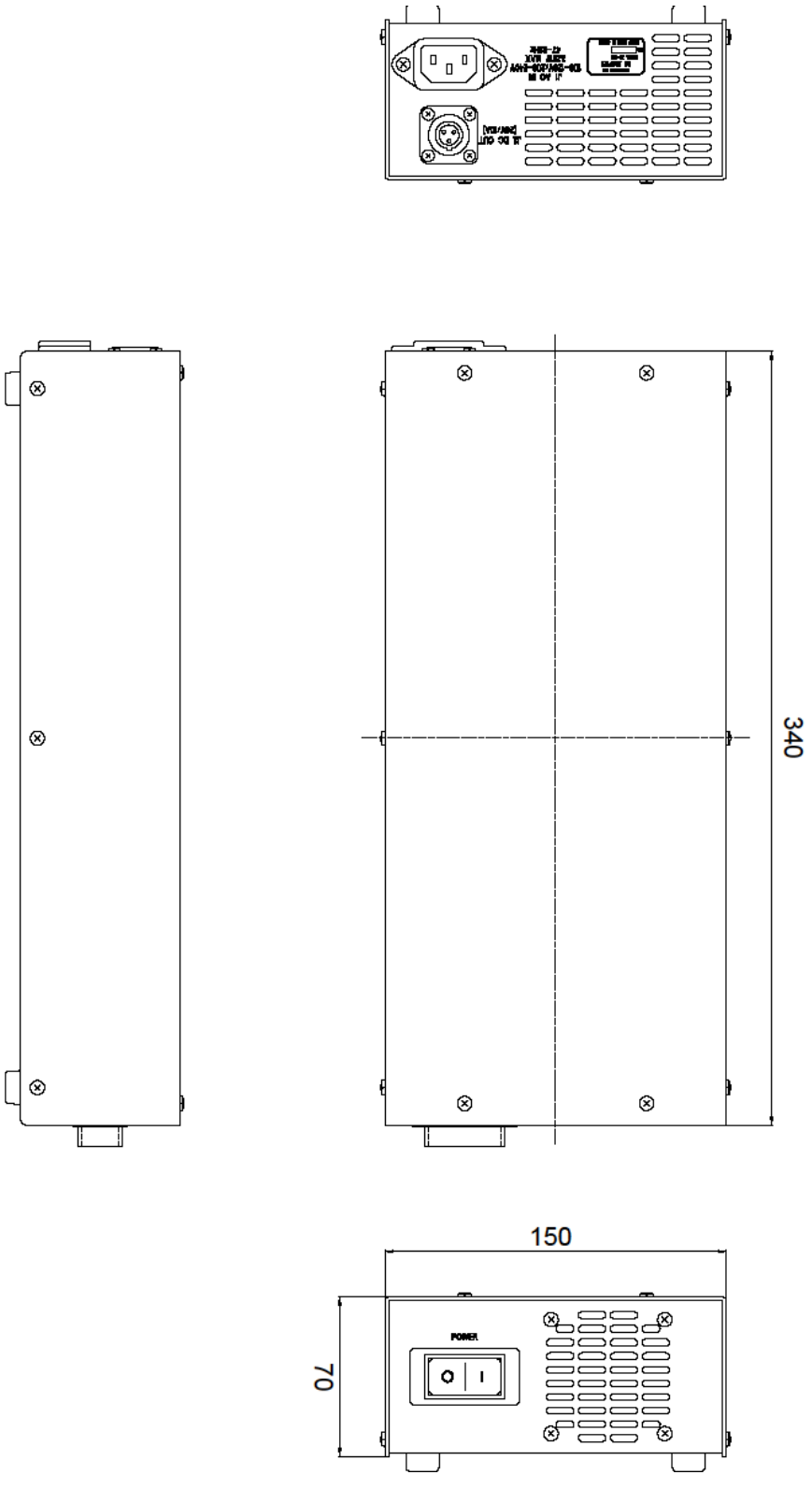
P3	Camera plug	(ID color：blue)	LEMO FGG.2B.318
P31	ETHER	ETHERNET	RJ45 plug

7.12 Exterior Diagram

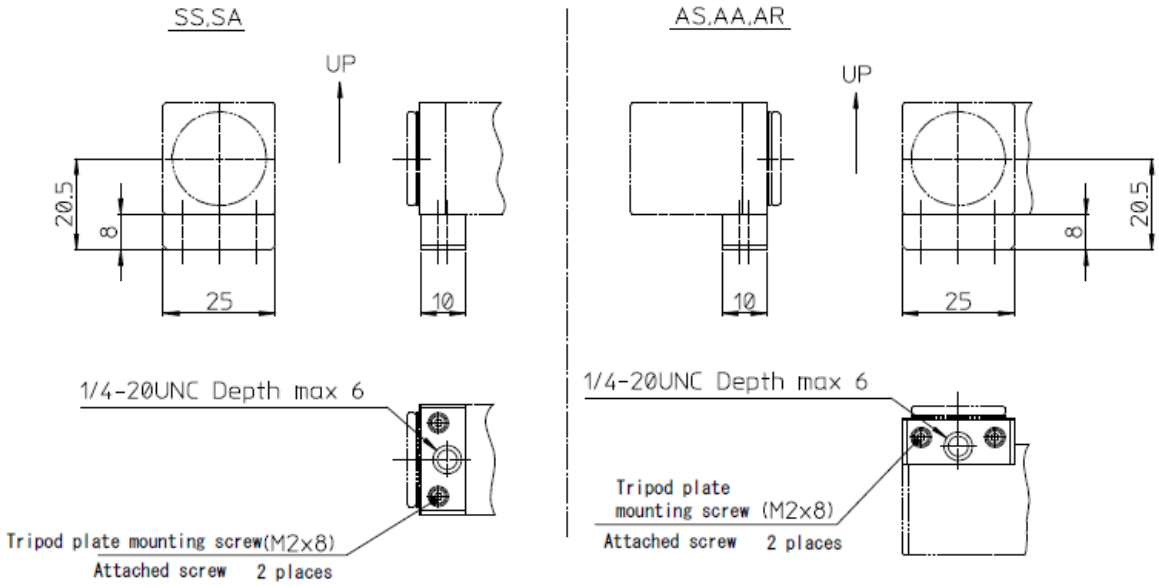
7.12.1 DRP



7.12.2 AC Adapter (Option)



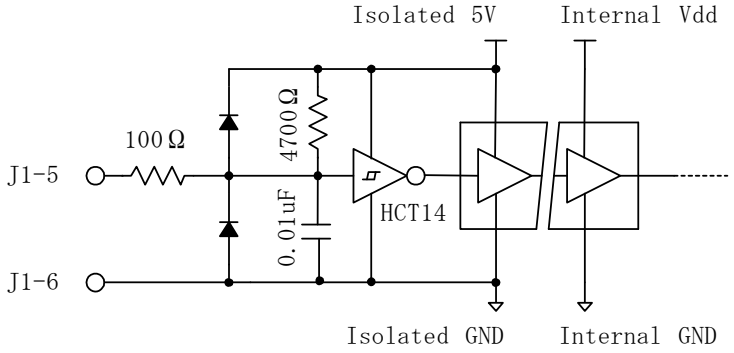
7.12.3 Tripod Plate (Option)



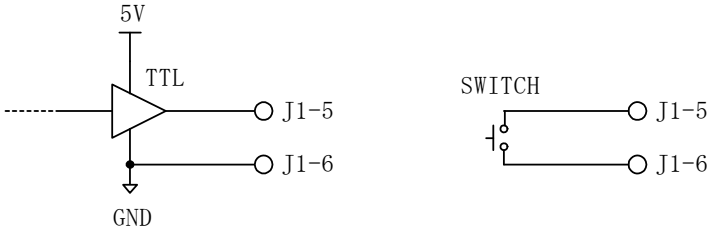
APPENDIX A Trigger

A1. TRIG1

・Equivalent Circuit Diagram for Input



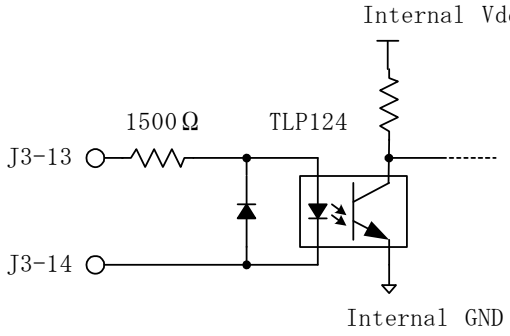
・Recommended interface circuit



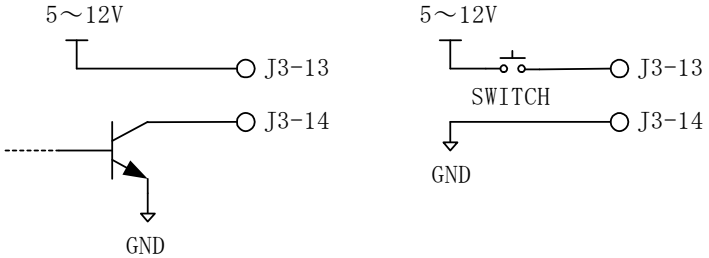
A2. TRIG2

・Equivalent Circuit Diagram for Input

Reference Value : The input pulse width must be approximately 10 μ sec or more with CRNTON, and approximately 350 μ sec or more with CRNTOFF.



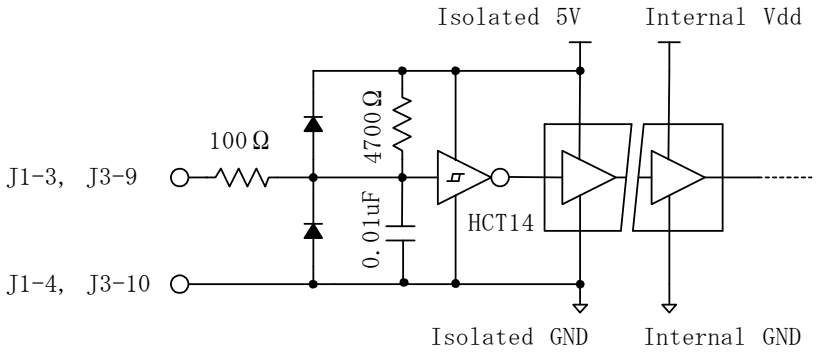
・Recommended interface circuit



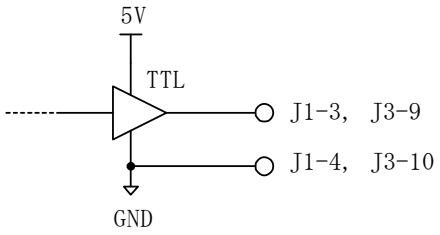
APPENDIX B Exposure Start Signal (EST) and Event Signal

B1. EST1、EST2 / EVENT

・Equivalent Circuit Diagram for Input

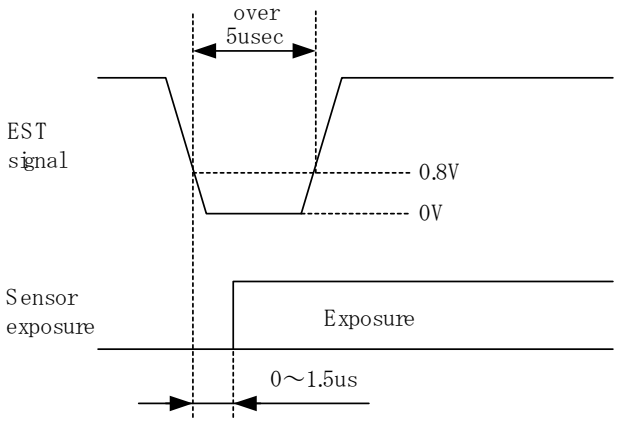


・Recommended interface circuit



B2. Timing

A timing diagram is shown when the noise filter value is 0 μ sec.



B3. Timing Restrictions

There are restrictions on the maximum recording speed such that

EST signal cycle ＞ 1 / maximum recording speed

must apply. If this is not met, proper recording is not possible.

Additionally, there are restrictions on the shutter speed such that

EST signal cycle ＞ shutter speed + 5.84 μ sec

must apply. If this is not met, proper recording is not possible.

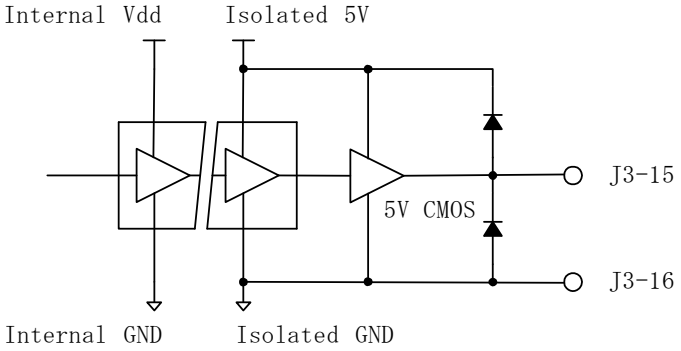
B4. Event Signals

The input signal level (if the J3 connector contact pin level is a valid level) is saved along with the image.
Verify the event signal valid polarity/invalid polarity via video output or the GXLink screen.
There are no limits on the number of event signal input.
There is no jump function.
This can be used in conjunction with the event trigger function.

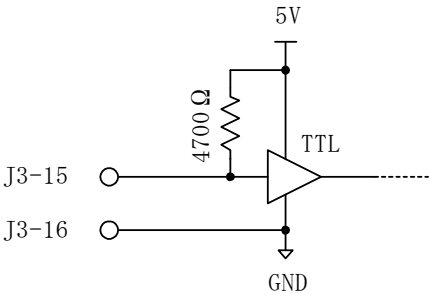
APPENDIX C Exposure Pulse Output (EPO)

C1. EPO

・Equivalent Circuit Diagram for Input

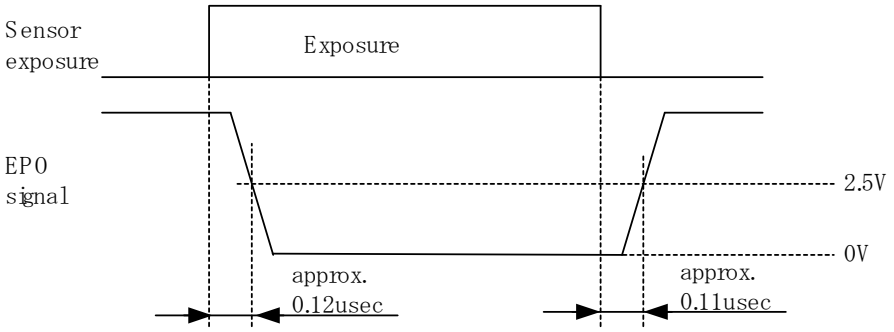


・Recommended interface circuit（In case of without external noise）



C2. Timing

The EPO signal delay relative to exposure is as follows



The exposure time and the jitter (shift from nearby exposure time) is within ±1.5μsec.

C3. Simple Synchronized Photography

Simple synchronized photography is possible using the exposure pulse output (EPO) signals with multiple GX series cameras or fx series cameras with the exposure start signal (EST) input function.
Also, synchronized photography is possible using cameras with equivalent functions from other companies.

Note) Here, "simple" includes the possibility that the time accuracy is not guaranteed due to signal delays or time shifts, and the restrictions on the same recording speeds for all of the cameras.

Simple synchronized photography is comprised of a system determined by master / slave cameras. There is one master camera among all of the cameras used, and the rest are slave cameras. If the GX series camera is the master camera, the exposure pulse output (EPO) for this camera is connected to the exposure start signal (EST) input for all of the other cameras.

If combining the GX series and the fx series, since the fx series EST input specifications only allow exposure to start with H→L edge signals, reverse output polarity is set on the master GX series camera so the L level is output during exposure. Also, the EST input setting for the slave GX series camera is H→L edge signals for the start of exposure.

If combining with cameras from other companies, refer to the manual to coordinate the signal polarity.

C4. Precautions

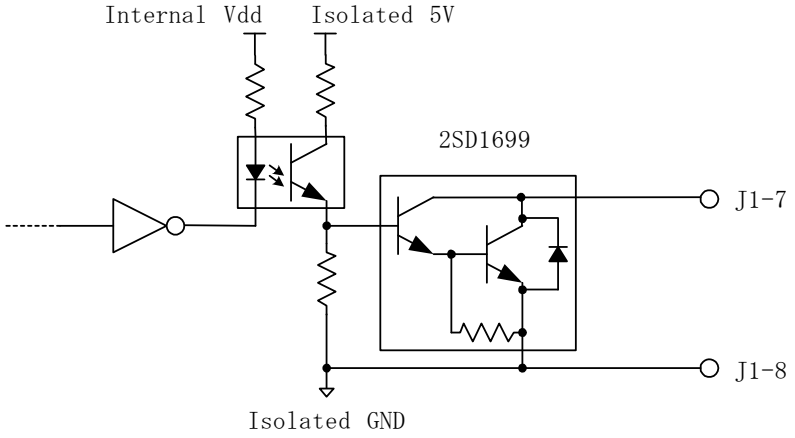
Only when the camera head is connected with CAM PORT1, the exposure pulse is output.

Since the exposure pulse output (EPO) signals are identical to the exposure time (shutter speed), the pulse widths are narrowed when a short exposure time is set. Precaution is necessary for signal transmission conversion to the proper interface and for the cable properties.
An incorrect pulse may be detected with the wrong method of use, and transmission may not be possible due to the elimination of pulses.

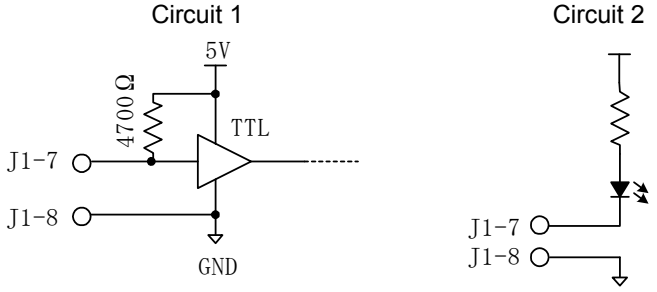
APPENDIX D Discrete Interface

D1. ARM Status Output

・Equivalent Circuit Diagram for Input



・Recommended interface circuit



・Example of Method Used

Circuit 1 of the hypothesized interface circuit is a circuit where the ARM status is detected as a logic signal.

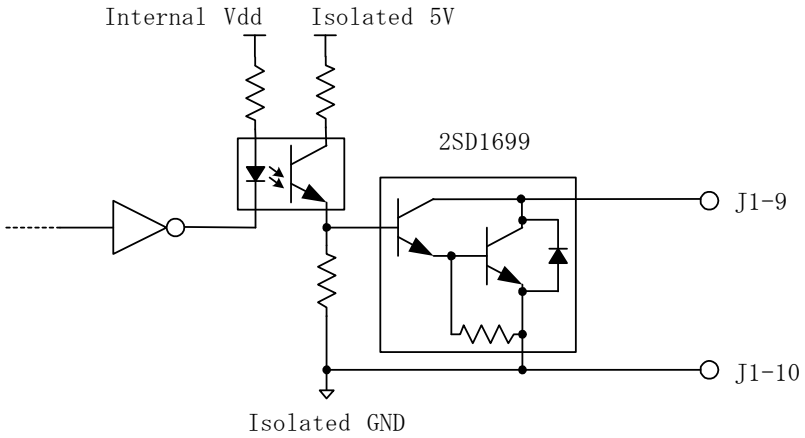
Circuit 2 is a circuit that visually checks the ARM status in the LED display. Set ARM to output the L level to light ARM.

To detect if multiple cameras are in ARM, use circuit 1, connect the ARM status output for all of the cameras (wired AND) and set ARM to output the H level. If even one camera is not in ARM, it switches to L level.

Take note that when the camera power is OFF, the output is at H.

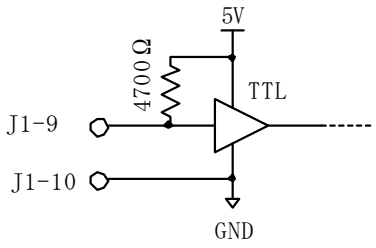
D2. FAULT Status Output

・Equivalent Circuit Diagram for Input

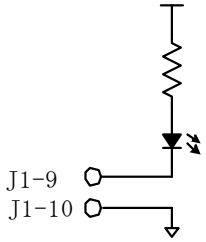


・Recommended interface circuit

Circuit 1



Circuit 2



・Example of Method Used

Circuit 1 of the hypothesized interface circuit is a circuit where the FAULT status is detected as a logic signal.

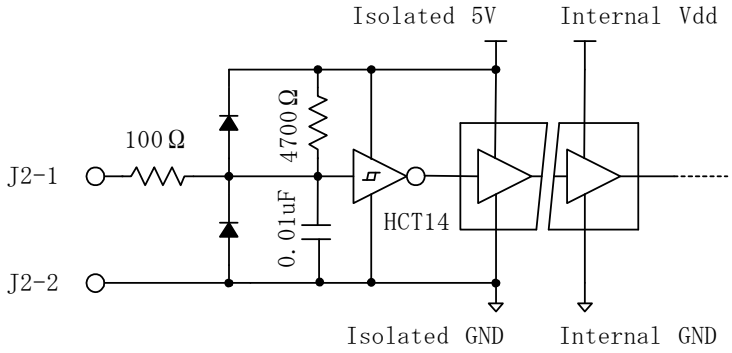
Circuit 2 is a circuit that visually checks the FAULT status in the LED display. Set FAULT to output the L level to light FAULT.

To detect if multiple cameras are in FAULT use circuit 1, connect the FAULT status output for all of the cameras (wired NOR) and set FAULT to output the L level. If all of the cameras are not in FAULT, it switches to H level.

Take note that when the camera power is OFF, the output is at H.

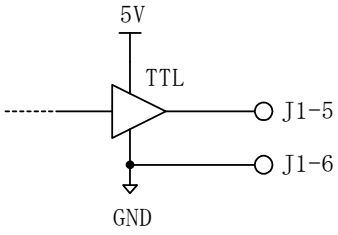
D3. ARM Command Input

・Equivalent Circuit Diagram for Input

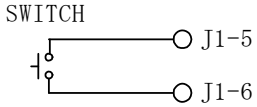


・Recommended interface circuit

Circuit 1



Circuit 2



・Example of Method Used

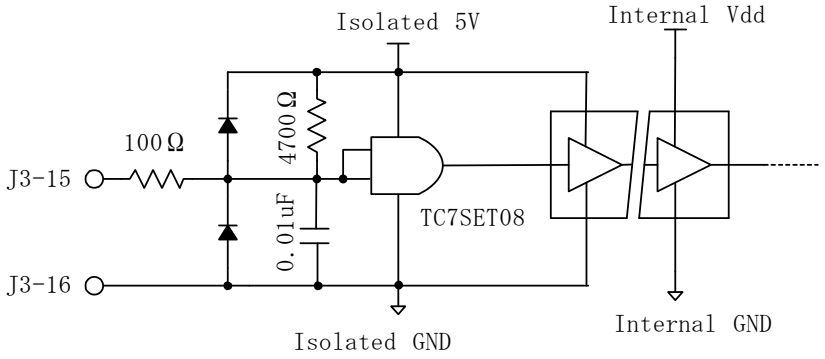
Circuit 1 of the hypothesized interface circuit is a circuit where the command is input in logic signals. The logic level can be set to H / L.

Circuit 2 is a circuit that inputs commands in contact signals. Commands must be set to the L level. To ARM multiple cameras simultaneously, the ARM command must be connected to all of the cameras with a single signal.

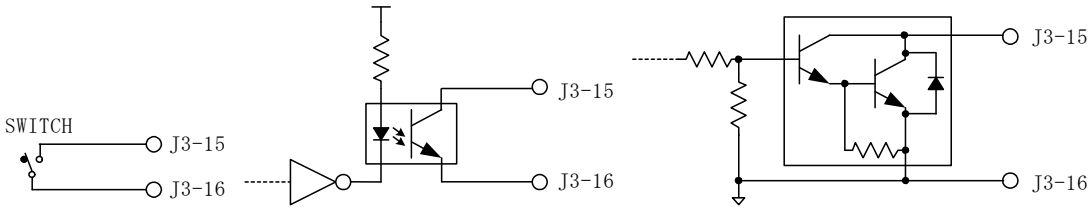
If the ARM command signal is not connected (open state), note that it will be at the H level.

D4. Power Control Input

・Equivalent Circuit Diagram for Input



・Recommended interface circuit



・Example of Method Used

The power is ON during the open state, or the H level, and if there is a short between two pins or at the L level, the power is OFF.

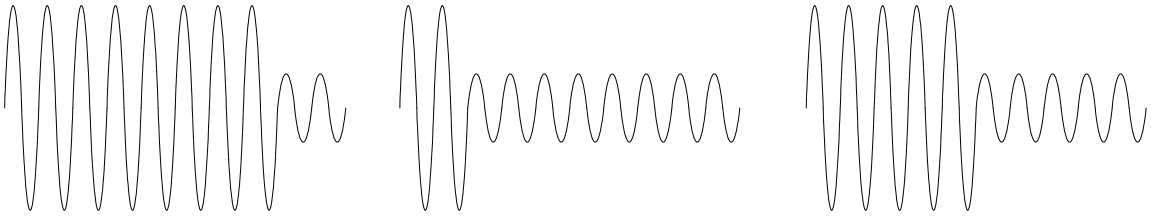
This signal designed for power control in the GX-HUB system.

APPENDIX E IRIG-B

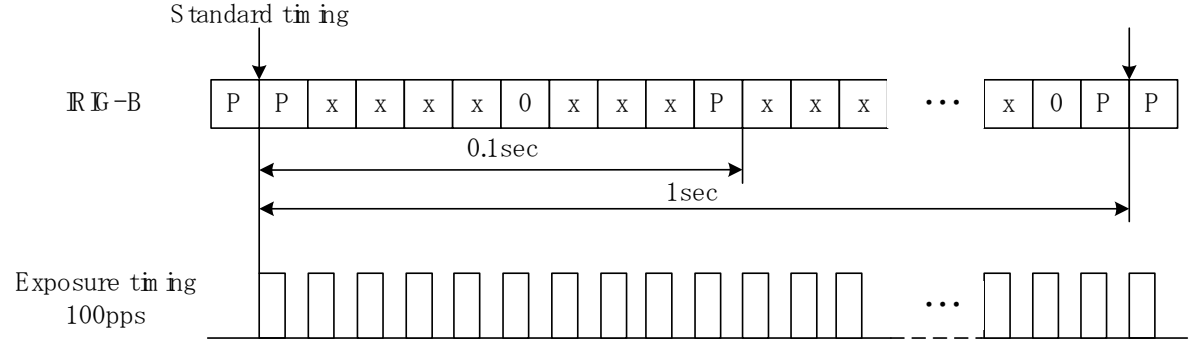
E1. Standard：IRIG Standard 200-98, IEEE1344

Compatible with 1kHz carrier modulation IRIG-B (B120, B122, B123 format).
Not compatible with unmodulated IRIG-B (B000, B003 format).

E2. Modulated IRIG-B Waveform and Exposure Time
Modulation in the following diagram is for P bit , 0 bit and 1 bit. The standard time is the top portion. There are 100 bits per second and 10 carriers per 1 bit. There are P bits for each 0.1 sec.1carrier is 1msec.



The example in the figure below shows the IRIG-B and the exposure time for 100 pps.
The figure below shows " x " as 1 or 0 bit.



At any photographic speed, the IRIG-B and exposure start must have the same standard time (with an exposure phase shift setting of 0°).

E3. Exposure Phase Shift Function
Even if the multiple camera heads of GX-5 is connected, the exposure phase shift setting cannot set a different respectively value.
Uses as a method to implement higher resolution and high speed recording when using multiple cameras. Depending on the camera placement, it may be possible to ignore the parallax during infinite telescopic photography. The settings are in phase angle degrees (units 0~359).
Exposure phase shift settings can only be set with the camera control software.

Example)
At 640 x 480 pixels, each DRP is set to 1,000 frames/sec, and four DRPs are subject to IRIG synchronization. With the respective phase shift for each DRP set to 0° , 90° , 180° , and 270° , photography can be conducted at 1,000 x 4＝4,000 pps.
1,000 frames/sec involves a frame interval of 1,000μsec so each camera shifts only 0μsec, 250μsec, 500μsec, and 750μsec from the IRIG-B standard time.

Note) With standard multiple synchronized DRP systems (such as GX-HUB system), the exposure time for all of the DRPs is synchronized so the phase shift should be set to 0°.

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8
Options

8.1 Specifications of the Main Options

8.1.1 JPAD3 (no G-resistant function)

1）	Power	Supplied from the camera
2）	Operating temperature and humidity	0~+40℃, 20~80%RH, no condensation
3）	Storage temperature and humidity	-10~+60℃, 20~80%RH, no condensation
4）	Exterior dimensions	Approximately W65 x H140 x D18 mm (excluding connector)
5）	Weight	Approximately 200g
6）	Connector	Plug：LEMO FGG.0B.306
7）	Cable	Pigtail, length approximately 2.9m
8）	Transmission	RS-232C, 38400 bps
9）	Operation part	Operation button, dial, lock switch, LED display
10）	LCD display	128 x 64dot, monochrome, back light

8.1.2 Cables

1） J1 Branch Cable

P1	Camera Plug	(ID color：yellow)	LEMO FGG.2B.310
P10	POWER	Power input	LEMO PHG.1B.303
P11	EST1	EST1 input	BNC plug
P12	TRIG1	Trigger1 input	BNC plug
P13	ARM-O	ARM Status output	BNC plug
P14	FAULT	FAULT Status output	BNC plug

2） J2 Branch Cable

P2	Camera Plug	(ID color：green)	LEMO FGG.2B.316
P20	ARM-I	ARM command input	BNC plug
P21	USB	USB	USB series A receptacle
P22	VF	Viewfinder	Hirose HR10A-7P-6S(73)
P23	JPAD	JPAD3	LEMO PHG.0B.306

3） J3 Branch Cable

P3	Camera Plug	(ID color：blue)	LEMO FGG.2B.318
P31	ETHER	ETHERNET	RJ45 receptacle
P32	EST2	EST2 input	BNC plug
P33	IRIG-B	IRIG-B input	BNC plug
P34	TRIG2	Trigger2 input	BNC plug
P35	EPO	Exposure pulse output	BNC plug
P36	PWRCNT	Power control input	BNC plug

8.1.3 5.7 inch LCD Viewfinder (No G-resistant function)

1）	Power	DC24V (20~32V, supplied from the camera, power switch included)
2）	Maximum power consumption	10 W
3）	Operating temperature and humidity	0~50℃, 30~80%RH(no condensation)
4）	Storage temperature and humidity	-25~+80℃
5）	Exterior dimensions	Approximately W155 x H117 x D35 mm (without the projection part etc)
6）	Weight	Approximately 600 g
7）	Video method	NTSC / PAL automatic conversion
8）	LC panel	5.7 inch, TFT
9）	Resolution	640 x 480
10）	Luminance	400 cd/㎡
11）	Angle of view	65 / 65°(left / right), 65 / 40°(top / bottom)
12）	Connector	Power and video supplied from the main camera unit using Hirose HR10A-7R-6P BNC Loop through Output (automatic terminal)

8.1.4 GX-HUB (G-resistant model)

1）	Number of GX camera connections	4
2）	Power input	DC20 ～ 32V, power consumption : maximum 12 W, AC adapter included
3）	Power switch	Yes、GX-HUB and camera link function ON/OFF
4）	Exterior dimensions	Approximately W280 x H75 x D230 mm (Without connector etc)
5）	Weight	Approximately 4.1 kg (Include mounting plate)
6）	Operating temperature and humidity	-10～+40℃, 20～80%RH, (no condensation)
7）	Storage temperature and humidity	-20～+60℃, 20～80%RH, (no condensation)
8）	Vibration	MIL-STD-810C METHOD 514.2 CATEGORY b2 standard (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
9）	Shock	half-sine, 11msec, 100G

10） Front port

- Individual input (BNC Connector x 3) IRIG IN, TRIG IN, EST IN
- GXSYS（LEMO Connector : EGG.2B.318）: GX-HUB, or branch input/output using J3 cable Gbit Ethernet, EPO(4 port OR output), IRIG IN, TRIG IN, EST IN,POWER CONT
- FXSYS (MIL Connector ACT90MC35SA) : connect with fx series M-HUB corresponds to fx series camera
- Priority order is FXSYS > GXSYS > individual input

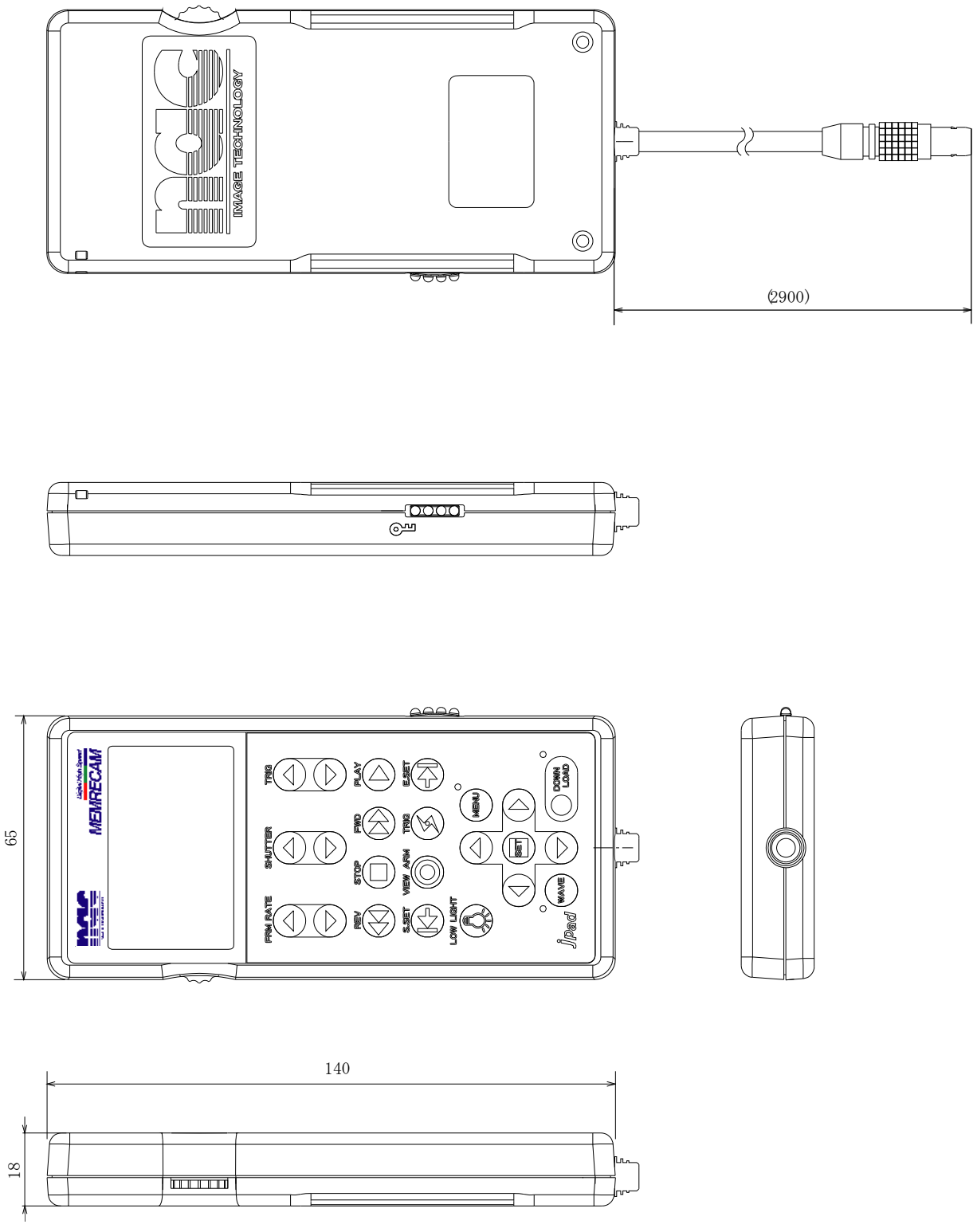
11）	Back port	GXSYS(LEMO Connector FWG.2B.318) 4 ports GX series camera J3 Connector or GX-HUB GXSYS and J3 remote cable connection
12）	LED display	IRIG, TRIG, EST, LINK(Gbit Ethernet), POWER

8.1.5 Booster Box (G-resistant model)

1）	Operating temperature and humidity	0～40℃, 30～80%RH (no condensation)
2）	Storage temperature and humidity	-10～60℃, 20～80%RH (no condensation)
3）	Vibration	MIL-STD-810C METHOD 514.2 CATEGORY b2 Standard (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
4）	Shock	half-sine, 11msec, 150G (However, it is 100G only by one axis.)
5）	Cables	Pig tail structure : Length Approximately 5m
6）	Exterior dimensions of cable	Approximately 12.9mm

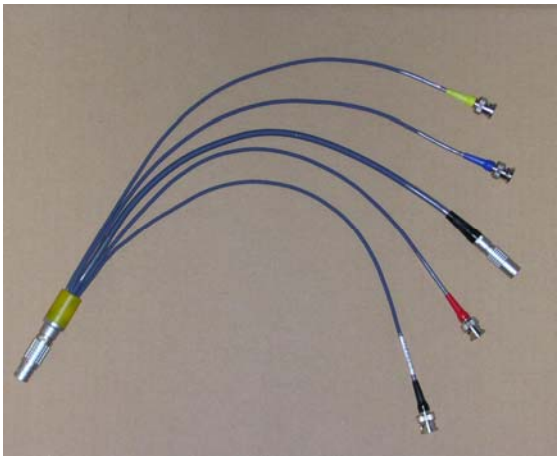
8.2 Exterior Diagram

8.2.1 JPAD3

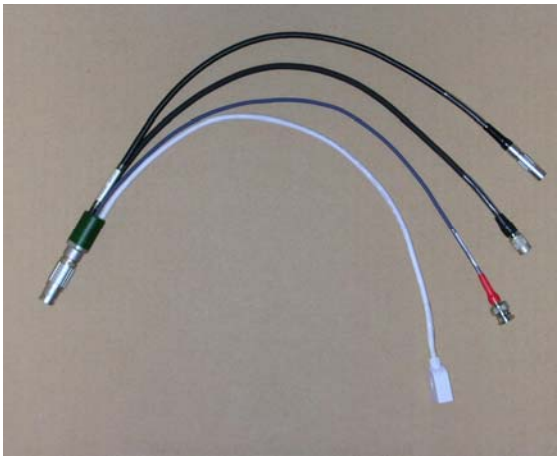


8.2.2 Cables

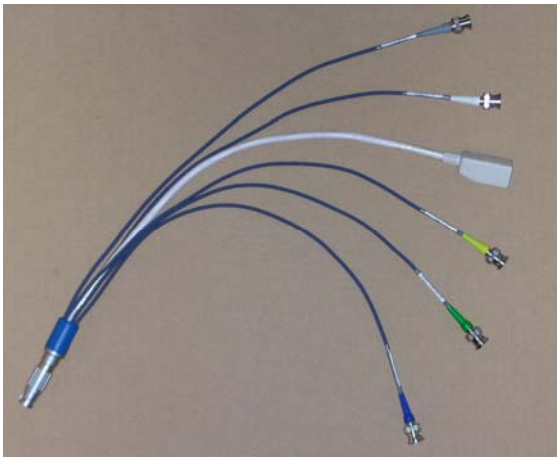
J1 branch cable



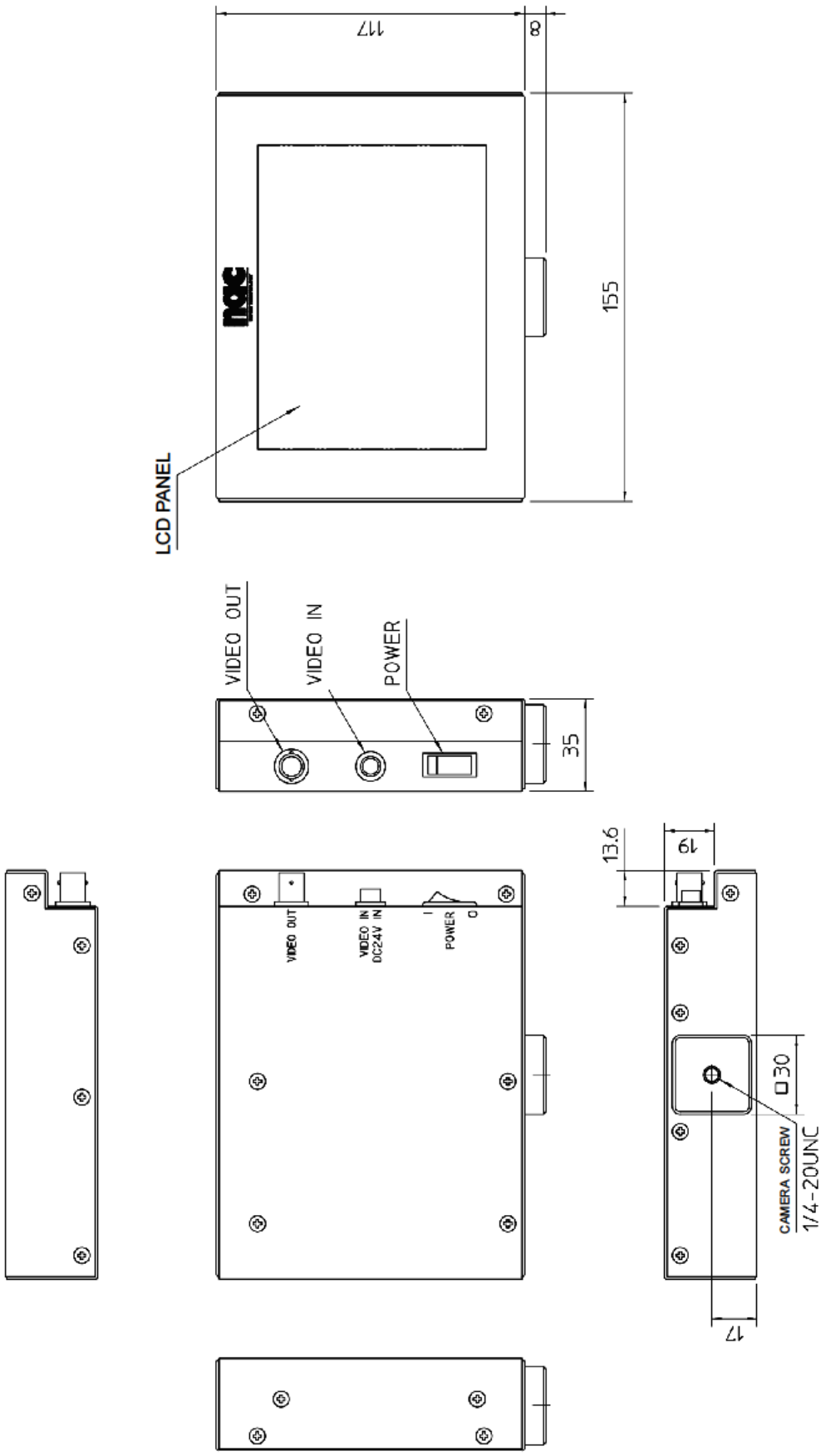
J2 branch cable



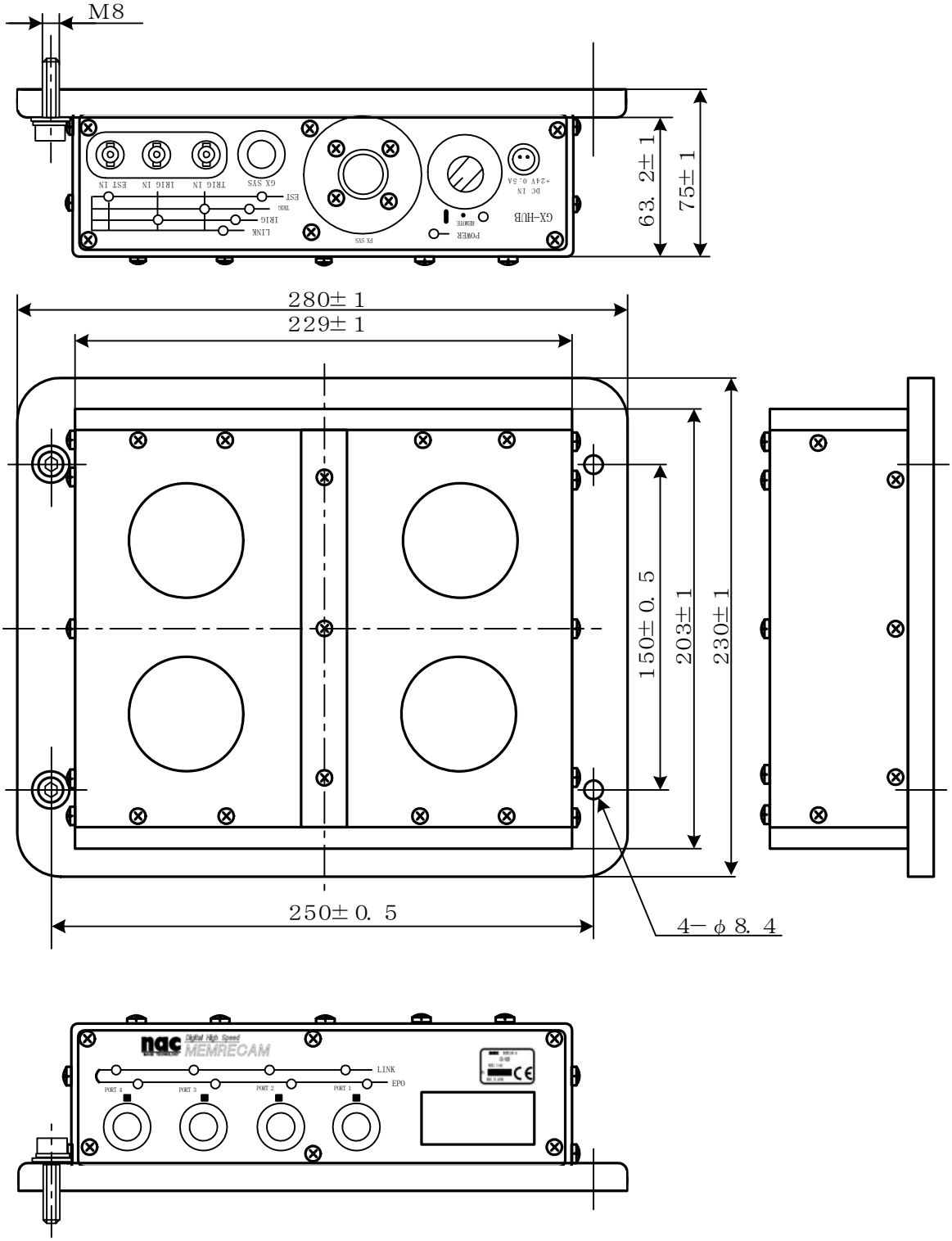
J3 branch cable



8.2.3 5.7 inch LCD Viewfinder



8.2.4 GX-HUB


M8
63.2±1
75±1
280±1
229±1
150±0.5
203±1
230±1
250±0.5
4−φ8.4
nac
Digital High Speed
MEMRECAM
LINK
EPO
PORT 4
PORT 3
PORT 2
PORT 1

8.2.5 Booster Box